Meeting Minutes Transmittal/Approval 072372
Unit Managers' Meeting
Remedial Action and Waste Disposal Unit/Source Operable Unit
3350 George Washington Way, Richland, Washington
March 1999

0051900

FROM/APPROVAL: ______________________ Date 7/22/99
Glenn Goldberg, 100 Area Unit Manager, RL (H0-12)

APPROVAL: ______________________ Date 8/19/99
~~Wayne Soper, 100 Aggregated Area Unit~~ Manager, Ecology (B5-18)
Jack Donnelly Cleanup Project Manager

APPROVAL: ______________________ Date 7-22-99
Dennis Faulk, 100 Aggregate Area Unit Manager, EPA (B5-01)

APPROVAL: ______________________ Date 8/18/99
Bryan Foley, 200 Area Unit Manager, RL (H0-12)

APPROVAL: N/A see above Date N/A
Joan Bartz/Shri Mohan, 200 Area Aggregate Area Unit Managers, Ecology (B5-18)

APPROVAL: N/A see above Date N/A
Ted A. Wooley, 200-B Area Project Manager, Ecology (B5-18)

APPROVAL: Robert G McLeod Date 5-20-99
Robert G. McLeod, 300 Area Unit Manager, RL (H0-12)

APPROVAL: Alex Stone Date 8-20-99
Alex Stone, 300 Area Project Manager, WDOE (B5-18)

APPROVAL: ______________________ Date 5/20/99
David R. Einan, 300 Area Aggregated Unit Manager, EPA (B5-01)

APPROVAL: N/A Date N/A
Ted A. Wooley, 300 Area Process Trenches Subproject Manager , Ecology (B5-18)

Meeting minutes are attached. Minutes are comprised of the following:

Attachment #1a and b	--	Agendas
Attachment #2	--	Attendance Record
Attachment #3	--	Meeting Minutes
Attachment #4	--	RA Regulator Review Dates – 100 Area
Attachment #5	--	Integration of Group 5 Remedial Design with 100 Area SAP/RDR Block Diagram/Summary Schedule
Attachment #6	--	100 Area Pipeline Evaluation Strategy for Remedial Decisionmaking - Draft
Attachment #7	--	Test Plan for Determination of Distribution Coefficient and Leachability of Hexavalent Chromium in 100 Area Hanford Formation Soils - Draft
Attachment #8	--	100 BC Group 1 116-C Liquid Waste Disposal Trench Vadose Zone Test Pit – Meeting Agenda – December 1, 1997
Attachment #9	--	Waste Stream Considerations and Waste Designation by Representative Sampling – 100-DR-1 Remedial Action Project
Attachment #10	--	200-ZP-1 Pump and Treat System – Maps and Charts
Attachment #11	--	Carbon Tetrachloride Concentrations at the 200-ZP-2 Soil Vapor Extraction Sites
Attachment #12	--	Soil Vapor Extraction Operating Plan at 216-Z-9
Attachment #13	--	Vadose Zone Monitoring Plan for 216-Z-1A, April 1999 through June 1999
Attachment #14	--	Plan for Passive Soil Vapor Extraction at 200-ZP-2
Attachment #15	--	RCRA Groundwater Monitoring at the 216-B-3 Pond Facility
Attachment #16	--	Hanford Barrier Performance Monitoring and Testing
Attachment #17	--	300-FF-2 Waste Site Disposition Tables
Attachment #18	--	RA Regulator Review Dates – 300 Area
Attachment #19	--	EPA Concurrence with Modifying the COC List for the North and South Process Ponds
Attachment #20	--	EPA Concurrence with Tanker Spill Cleanup Plan

Prepared by: Amy J Jones Date 9/9/99

Amy J. Jones (H0-10)/Tamen Rodriguez (H0-17)

Concurrence by: [signature] Date 9/13/99

Vern Dronen, BHI Remedial Action and Waste Disposal Project Manager (H0-17)

UNIT MANAGERS' MEETING AGENDA

3350 George Washington Way, Rooms 1B45 and 2A01
March 18, 1999

<u>1:00 – 3:00 p.m.</u>   <u>100 Area</u>

- EPA National Remedy Review Board for Burial Ground FFS/PP
- S/M&T Status 100-KE/KW Effluent Pipe Removal and Reactor Legacy Waste Removal Tasks
- Group 5 Documents (RDR Update, SAP Update, and Confirmation SAP)
- Pipelines Evaluation
- 100-N RODs Status
- Remaining Sites ROD Status
- Burial Ground FFS Status
- National Remedy Review Board
- Update on Cr^{6+} Kd Test Plan
- Update on D Area Vadose Zone Characterization (116-DR-1/2)
- Cr^{6+} Remediation at 100 D Area/Group 2, and in General
- Progress on Group 3 Small Sites/100-BC Near Reactor
- Group 4 (100-H Area Startup)/116-H7 First Site
- Site Closeout Reports

UNIT MANAGERS' MEETING AGENDA

3350 George Washington Way, Room 2A01
March 18, 1999

8:00 a. m. 200 Area

- **Signing the 1/19 – 200 Area Groundwater UMM minutes (20 minutes)**
  - Status of P & T System
  - Comments on Annual Report
  - DNAPL Investigation
- **Summary of ZP-2 Non-Operational Monitoring (30 minutes)**
  - Start up of ZP-2
  - D & D of 1000/1500 cfm SVE Systems
  - Passive Strategy
- **Overview 200 Area RCRA Groundwater Monitoring (20 minutes)**
  - Status brief on monitoring activities related to 216-B-3 Pond
- **200 Area RI/FS Implementation Plan (10 minutes)**
  - Status
- **200-CW-1 Gable Mountain/B Pond and Ditches (10 minutes)**
  - Status
- **200-CS-1 Chemical Sewer Waste Group (10 minutes)**
  - Status DQO schedule
- **200-BP-1 Operable Unit (10 minutes)**
  - Status Prototype Barrier Closeout Activity

UNIT MANAGERS' MEETING AGENDA

3350 George Washington Way, Rooms 1B45 and 2A01
March 18, 1999

10:00 a.m. **300 Area** **Room 2A01**

300-FF-2 Assessment

- 300-FF-2 Focused Feasibility Study

300-FF-1 Operable Unit

- South Process Pond Remediation Status
- Verification Sampling Related Activities
  - Contaminant of Concern Reduction for North and South Process Ponds
  - Tanker Spill Area Sampling
  - North Process Pond Sampling and Locations
  - Landfill 1D Lead Contaminated Soils Waiver
- Disposal of Liquid Wastes to ETF
- TPA Milestone Revision
- 618-4 Burial Ground Drummed Waste Treatment and Disposal Plan

Remedial Action and Waste Disposal Unit Managers' Meeting
Official Attendance Record – 100 Areas
March 18, 1999

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
Glenn Goldberg	DOE	Proj. Manager	376-9552
Frank Corpuz	BHI	Proj Engr	373-1661
Fred Roeck	BHI	Envir Lead	372-9086
Ella Coenenberg	ERC	Assess. Lead	372-9303
Rich Donahue	BHI	Task Lead	372-9565
Pamela Innis	EPA	Project Manager	376-4919
Alvin Langstaff	BHI	Task Lead	373-5876
Richard Jaquish	WDOH	HP	627-3540
David Blumenkranz	CHI	Group 5 CHI Task Lead	372-9658
Jon Fancher	CHI	Closeouts Lead	372-9610
Chris Kemp	BHI	Legacy Waste + Effluent Pipe Removal	373-6926
JOAN WOOLARD	BHI	Reg. Support	372-9649
John Sands	DOE	Legacy Waste	372-2282
Arlene Tortoso	DOE	100 Area Groundwater	373-9631
Wayne Soper	Ecology	D Area + Groundwater	736-3049
Dennis Faulk	EPA	RPM	376-8631
JEFF ARMATROUT	BHI	TASK LEAD	531 0676
Tom Ferns	DOE	PM	372-0649
JON YERXA	DOE	EAP	376-9628

Remedial Action and Waste Disposal Unit Managers' Meeting
Official Attendance Record – 200 Areas
March 18, 1999

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
Dennis Faulk	EPA	RPM	6-8631
Curtis Wittreich	EAC	200 A	2-9586
Arlene Tortoso	DOE	200 Area GW	373-9631
Bryan Foley	DOE-RL	200 Area	376-7087
Ted Wooley	Ecology	B AREA 200 CW	736-3012
GEORGE C HENCKEL	BHI	GW operations	372-9381
MARV FURMAN	DOE	GW	373-9630
Stuart P Luttrell	PNNL	GW	376-6023
Brent Barnett	PNNL	GW	376-3416
Tony Knepp	BHI	GW/VZ	372-9189
Virginia Rohay	CHI	ZP-1/2	372-9098
Tom Post	EPA	200 Area	376-6623

Remedial Action and Waste Disposal Unit Managers' Meeting
Official Attendance Record – 300 Area
March 18, 1999

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
Ella Coenenberg	ERC	CSM	372-9303
Tom Post	EPA	RPM	376-6623
Larry Hulstrom	ERC	Technical Support	372-9319
Bob McLeod	DOE	U.M.	372-0096
John April	BHI		2-9632
Richard Carlson	BHI	Technical Lead	373-3008
FRED ROECK	BHI	Environmental Lead	372-9086
JON YERXA	DOE	EAP-TPA	376-9628
Jeff James	BHI	300-FF-1 TASK Lead	373-6372
Rick Donahue	BHI	Task Lead	372-9565

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MEETING MINUTES
REMEDIAL ACTION AND WASTE DISPOSAL
UNIT MANAGERS' MEETING -- 100 AREA
March 18, 1999

Attendees: See Attachment #2a.

Agenda: See Attachment #1a.

Topics of Discussion:

100 Area Assessment and Remedial Action

1. EPA National Remedy Review Board (NRRB) for Burial Ground FFS/PP – EPA stated that the NRRB will meet in July and September. To meet the July date, EPA stated that the Burial Ground FFS/PP would need to be submitted by late May or early June, four weeks before the NRRB meets. DOE/BHI commented that they would need to review the Burial Ground schedule to determine if the July date can be met. The Burial Ground FFS, Draft A, was transmitted to DOE for management and technical review before being submitted to the regulators on April 22, 1999.

   Regarding a topic not included on the agenda, a schedule was provided to EPA, Ecology, and RL which identifies regulator review dates for the various 100 Area documents and verification packages (see Attachment #4).

2. S/M&T Status 100-KE/KW Effluent Pipe Removal and Reactor Legacy Waste Removal Tasks – At the February UMM, BHI requested clarification from EPA and Ecology on whether WAC 173-400 and WAC 173-460 apply to pipe cutting. EPA responded that since the ROD covering the pipe cutting does not identify those regulations as ARARs, they are not considered applicable for sites where EPA is the lead regulatory agency. Further, the regulations are not considered applicable because they are intended for sources (defined as " all emissions units...whose activities are ancillary to the production of a single product. Excavating and pipecutting do not help produce a product.") Ecology has deferred a decision pending additional input form the 100-N Area and other Ecology staff.

   Regarding a topic not included on the agenda, Waste Management Northwest Federal Services has proposed that, prior to spraying of the unstabilized portion of the 218-E-12B burial ground, the Piper's daisy growing on the site be transplanted to the 116-C-1 revegetated site. Piper's Daisy is listed as a State of Washington Heritage Program species of concern because of its limited habitat and low population numbers. DOE, EPA and Ecology each concurred with that plan of action; however, EPA requested verification that the Piper's daisy is uncontaminated prior to the transfer, in order to avoid cross-contamination at 116-C-1.

3. Group 5 documents (RDR Update, SAP Update, and Confirmation SAP) – A schedule of the Group 5 document updates was provided (see Attachment #5). The handout showed that CSE DQO Workbook, the 100 Area SAP, and the 100 Area RDR/RAWP are scheduled for parallel reviews, beginning in July and ending on September 30, 1999.

4. Pipelines Evaluation - A draft copy of the strategy for 100 Area pipeline evaluation was submitted to the regulators for consideration (see Attachment #6). EPA will respond to the strategy at the April UMM.

   Regarding a topic not included on the agenda, DOE is still considering how to address the issue of responsibility for the outfall structures, as requested by EPA at the February UMM. DOE expects to provide a decision at the April UMM.

5. 100-N RODs Status - A comment/resolution meeting on the 100-N RODs was held on March 17. Current discussions concern funding and rewriting sections of the RODs that relate to groundwater. The next meeting is scheduled for March 22.

6. Remaining Sites ROD Status - The EPA is behind schedule on the Remaining Sites ROD, which is currently expected in mid-May.

7. Burial Ground FFS Status – Discussed under topic #1.

8. National Remedy Review Board – Discussed under topic #1.

9. Update on Cr^{6+} Kd Test Plan - BHI submitted a draft copy of the Cr^{6+} Kd Test Plan to EPA and Ecology for review (see Attachment #7). Comments to BHI are expected on April 5, 1999.

10. Update on D Area Vadose Zone Characterization (116-DR-1/2) - An example from the 116-C1 characterization was provided to Ecology (see Attachment #8). The 116-DR-1/2 vadose characterization borehole is scheduled for June 1999. A meeting for planning/concurrence of the final details will be held in the near future with Ecology and RL. The schedule is to be determined. EPA commented that the purpose/description and results of the borehole need to be explained in detail in the closeout reports, where the results are used for site closeout purposes.

11. Cr^{6+} Remediation at 100-D Area/Group 2, and in General – Results from the 116-D-7 test pits, which show that elevated Cr^{6+} is located at the base of the remedial action excavation, will be available soon (in approximately 2 weeks). Once all the sample results are in and have been evaluated, a meeting will be held to discuss the results.

12. Progress on Group 3 Small Sites/100-BC Near Reactor - Progress at the Group 3 Small Sites/100-BC Near Reactor is on schedule. EPA, Ecology, DOE and BHI will tour the sites on March 23, 1999 and discuss milestone revisions.

13. Group 4 (100-H Area Startup)/116-H7 First Site - A handout was provided, which documented prior concurrence on waste stream considerations and waste designation by representative sampling at the 116-H7 site (see Attachment #9). Documentation of the appropriate Waste Designation is captured in the approved Waste Profiles for the 116-H-7 site, which is available to Ecology as a reference, upon request. Digging at Group 4 began on March 17, 1999 and seven containers of dirt were shipped to ERDF. At the location where excavation began, little to no clean overburden was encountered based upon field screening determinations. The milestone was met and work will continue on schedule.

14. Site Closeout Reports – BHI provided copies of revised Closeout Verification Packages to Ecology for the following WIDS sites: 100-D-4 (old 107-D5), 100-D-20 (old 107-D3), 100-D-21 (old 107-D2), 100-D-22 (old 107-D1), and 1607-D2:1 (old 1602-D2 abandoned tile field).

MEETING MINUTES
REMEDIAL ACTION AND WASTE DISPOSAL
UNIT MANAGERS' MEETING -- 200 AREA
March 18, 1999

Attendees: See Attachment #2b.

Agenda: See Attachment #1b.

Topics of Discussion:

1. Signing the 1/19 – 200 Area Groundwater UMM minutes

   a. *Status of P&T System* – A collection of maps and charts detailing the status of the 200-ZP-1 (P&T) System was provided (see Attachment #10). The data in the handout showed that the carbon tetrachloride concentration has increased slightly and there is a steady drop in the regional water table. Sampling techniques and possible causes for the results shown in the handout were discussed.

   EPA requested that it be notified if "hits" of carbon tetrachloride continue to be detected. BHI asserted that the requirements on containment will be met. Technetium was detected in most of the wells included in the most recent set samples taken from the extraction wells; however, there were no signs of accumulation. Additional samples will be taken next week (March 22-26) to verify and monitor the technetium levels in the extraction wells. The results of those samples are expected to be available in approximately two weeks.

   b. *Comments on Annual Report* – EPA has not completed its review of the Annual Report and is not prepared to submit comments at this time.

   c. *DNAPL Investigation* – Geophysicists from the University of South Carolina are at the Hanford Site for 3 weeks to collect data as part of their proof-of-principal-concept study. The study will use two and three dimensional high resolution seismic reflection data to determine the location and distribution of subsurface DNAPL contamination at the Hanford Site. EPA and DOE plan to visit the site on April 1.

   The carbon tetrachloride ITRD will be meeting in Richland on Monday and Tuesday, March 29-30, 1999.

2. Summary of ZP-2 Non-Operational Monitoring

   a. *Start-up of ZP-2* – A handout detailing the carbon tetrachloride concentrations at the 200-ZP-2 Soil Vapor Extraction Sites was provided (see Attachment #11). The first table of the handout showed the monitoring results for FY97-FY99 and the second table showed the monthly readings for July 1998-February 1999. A discussion of the handout followed. The same locations shown in the handout will be monitored once more next week (March 22-26). Once the monitoring is complete, the 200-ZP-2 vapor extraction system is scheduled for restart on April 1, 1999.

ERC submitted the "Soil Vapor Extraction Operating Plan at 216-Z-9" to EPA (see Attachment #12). The proposed operating plan outlined the strategy for extraction from the 200-Z-9 extraction wells during April-June 1999, beginning with start-up of the same four wells as in 1998. During a discussion of the handout, EPA recommended that a comparison be made of the time for concentrations levels carbon tetrachloride to decline this year vs. last year. EPA gave official approval of the 200-Z-9 operating plan.

ERC submitted the "Vadose Zone Monitoring Plan for 216-Z-1A, April 1999 through June 1999" to EPA (see Attachment #13). It was noted that no deep wells were chosen for vadose zone monitoring because they will be included in the passive monitoring plan. After discussion of the handout, EPA gave official approval of the 216-Z-1A monitoring plan.

b. *D&D of 1000/1500 cfm SVE Systems* – DOE is preparing paperwork required to excess the 1000/1500 cfm SVE systems in April/May 1999. EPA's official recommendation is for DOE to wait until the ITRD for the carbon tetrachloride plumes is complete before making any final decisions to excess the equipment.

c. *Passive Strategy* – ERC submitted the "Plan for Passive Soil Vapor Extraction at 200-ZP-2" to EPA (see Attachment #14). The proposed draft of the plan outlines the justification for converting eight selected deep wells to a passive soil vapor extraction system. During a discussion of the handout, EPA recommended that the detail of the plan be expanded and that, if the plan is implemented, a comparison study of the passive vs. the baseline methods be conducted. EPA is expected to review the 200-ZP-2 plan.

3. <u>Overview 200 Area RCRA Groundwater Monitoring</u> – *Status Brief on Monitoring Activities Related to 216-B-3 Pond* – PNNL provided a handout detailing the RCRA groundwater monitoring at the 216-B-3 Pond facility (see Attachment #15). The handout was discussed in detail. The overall results of the monitoring at the 216-B-3 Pond were that no TOX/TOCs were found and although a few tentatively identified compounds were detected at low levels, in recent years, all detected compounds have been below the acceptable limits.

4. <u>200 Area RI/FS Implementation Plan</u> – *Status* – DOE is behind schedule on issuing Rev. 0 of the RI/FS Implementation Plan. DOE is currently awaiting additional input and intends to issue Rev. 0 soon.

5. <u>200-CW-1 Gable Mountain/B Pond and Ditches</u> – *Status* – The 200-CW-1 work plan is on schedule.

6. <u>200-CS-1 Chemical Sewer Waste Group</u> – *Status of the DQO Schedule* – The DQO effort is underway and Ecology is expecting a call for an interview.

7. <u>200-BP-1 Operable Unit</u> – *Status Prototype Barrier Closeout Activity* – ERC provided a handout covering the workscope for closeout of monitoring and testing at the Hanford barrier (see Attachment #16). In a discussion of the handout, EPA noted the importance of maintaining some minimal form of monitoring at the barrier after closeout. DOE responded that further monitoring has not yet been addressed in any detail and that funding for such activities would not be included in the treatability budget. DOE is expected to submit Draft A of the treatability test report to EPA and Ecology in the near future. EPA recommended that, once the treatability test report has been issued, EPA and Ecology be given 30 days to approve demobilization and that DOE suspend all demobilization activities at the Hanford barrier pending approval.

MEETING MINUTES
REMEDIAL ACTION AND WASTE DISPOSAL
UNIT MANAGERS' MEETING -- 300 AREA
March 18, 1999

Attendees: See Attachment #2c.

Agenda: See Attachment #1c.

Topics of Discussion:

300-FF-2 Assessment

1. 300-FF-2 Focused Feasibility Study – The preparation of the 300-FF-2 FFS is proceeding on schedule. DOE and the ERC have met with EPA to review an annotated outline. Preparation of the FFS, using the approved outline, is underway.

   The reclassification process on the 300-FF-2 waste sites has recently been completed. Waste site disposition tables were handed out and discussed (see Attachment #17).

   Data from groundwater sampling performed in January, near the 316-4 Crib and the 618-11 burial ground, is starting to come in. A more detailed reporting of the results should be available at the April UMM.

   A schedule of deliverables to the Regulators was provided (see Attachment #18).

300-FF-1 Operable Unit

General Information – Tom Post of EPA introduced himself as the replacement for Dave Einan as the EPA lead for the 300-FF-1 Operable Unit. Dave Einan will be transferring to the ERDF Project. A transition period is currently underway. Bob McLeod (RL) provided Tom Post a brief orientation, describing the 300-FF-1 OU waste site history and the scope of the remedial action project.

1. South Process Pond Remediation Status – The South Process Pond is currently under active remediation with approximately 1/4 to 1/3 of the excavation completed. A history of the South Process Pond and the current excavation approach for the undetermined areas (berm/dike areas) was discussed. The original plan was to excavate in horizontal lifts and sort all the soil volume associated with the perimeter berms. However, after careful review of the test trench data, BHI recommended that the field screening data be evaluated as the excavation proceeds, in order to confirm that an alternative excavation approach is acceptable. This recommendation received previous concurrence from Dave Einan (EPA) and Bob McLeod (RL).

   The proposed alternative excavation approach begins with a field screening survey being performed after clearing and grubbing sections (top and inner side slopes) of the perimeter berms. If the slope and top surface is below cleanup levels, no further excavation of that portion of the berm is currently planned. If contamination is identified on the top of the berm, a horizontal lift is removed. If only the inner slope is contaminated, a vertical lift is removed. These areas are then resurveyed after each lift to determine if removal of an additional lift is required. Once the horizontal and vertical lifts survey clean, no further excavation of that portion of the berm will be planned. Field screening surveys have identified two plumes in the pond that may increase the overall volume of contaminated soil from the pond.

2. Verification Sampling Related Activities

   a. *Contaminant of Concern Reduction for North and South Process Ponds* – Several of the COCs were listed in the 300-FF-1 OU ROD on the sole basis of data from the process trenches. The 300-FF-1 sampling and analysis DQO addresses COCs on an operable unit basis and does not specify unique COC lists for each individual waste site. After review of the ROD and the RI data for the North and South Process Ponds, EPA agreed to eliminate arsenic, benzo(a)pyrene, chrysene, and thallium from the list of analytes requiring verification sampling and analysis at the North and South Process Ponds, as is currently addressed in the 300-FF-1 SAP, DOE/RL-96-70, Rev.0, Appendix C, (see Attachment #19).

   b. *Tanker Spill Area Sampling* – At the January 1999 UMM, ERC submitted to EPA a draft plan to include cleanup of the tanker spill area in the North Process Pond Cleanup Package. EPA concurred with the plan (see Attachment #20).

   c. *North Process Pond Sampling and Locations* – At the February 1999 UMM, ERC submitted to EPA a draft plan to complete the verification sampling in the North Process Pond prior to completing remediation. EPA had concurred with the plan, provided that there are no major interferences with the sample locations. The sample locations have since been surveyed and no major interferences were identified.

   d. *Landfill 1D Lead Contaminated Soils Waiver* – The remaining lead contaminated soil at Landfill 1D is below the MTCA industrial cleanup level for lead and is also below the ROD radioactive waste cleanup level such that the soil could remain in place. However, that same soil contains debris that must be sorted out and will require disposal at ERDF. DOE is currently planning to send a letter to EPA that describes the options for treating and/or disposing of these soils. The disposal options are 1) sort and dispose of the debris on site (lowest-cost method); 2) place the soil and debris in containers and ship to ERDF for treatment and disposal (highest-cost method); and 3) obtain a variance to ship the soil and debris to ERDF for direct disposal, without treatment (mid-cost method). DOE recommended that the option to obtain a variance be pursued. A decision from EPA is pending.

3. Disposal of Liquid Wastes to ETF – DOE requested that EPA approve the ETF as a liquid waste disposal facility for 300-FF-1 waste (see the February UMM minutes for details). EPA continues to review the request.

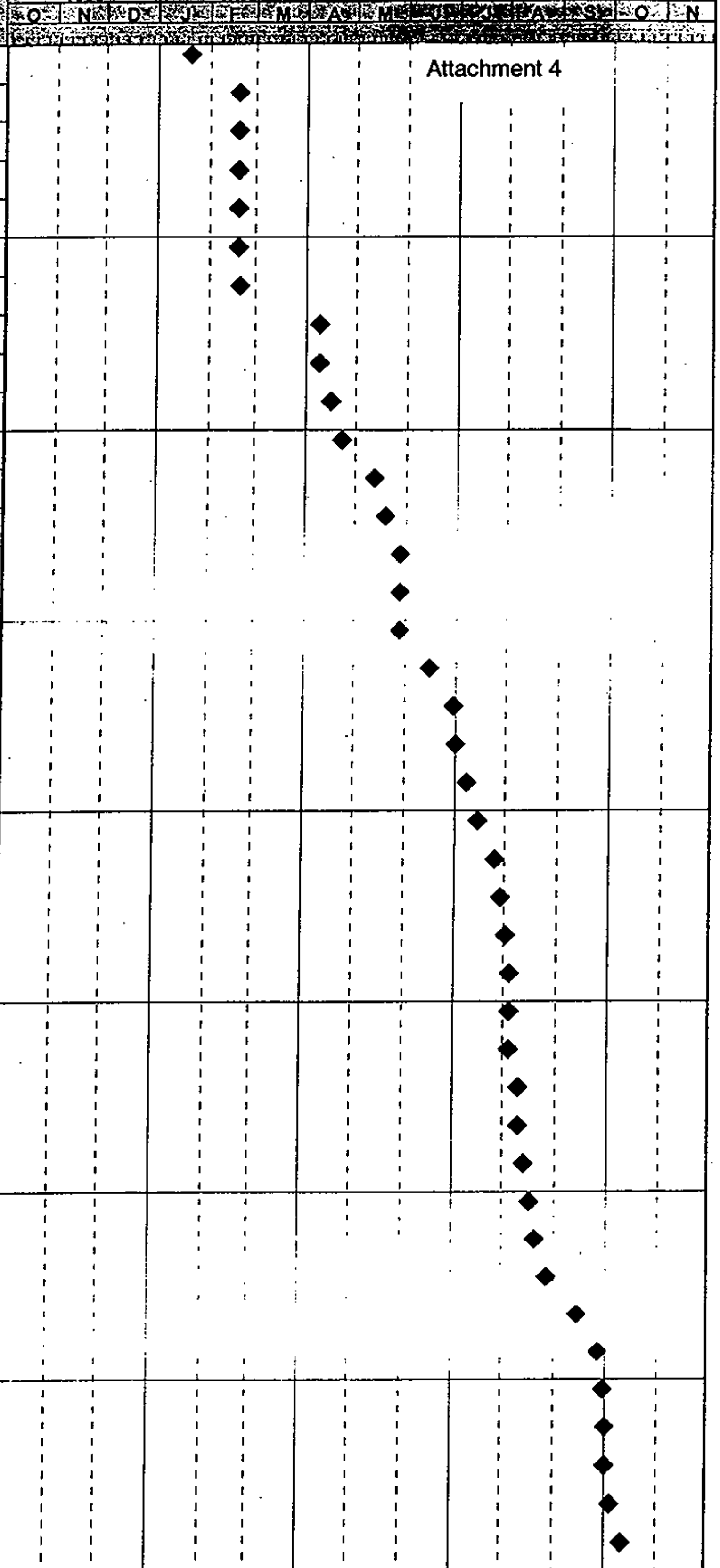
4. TPA Milestone Revision – The TPA milestone (M-16-03D) for completing remediation of the 300-FF-1 OU, currently set for May 1999, cannot be met. Justifications for the delay are detailed in a formal TPA request, which was previously submitted to EPA. In the change request, DOE proposed to revise the current milestone as two separate milestones, one (M-16-03F) addressing completion of excavation of the Burial Ground and treatment/disposal of the associated drum waste (TBD) and one (M-16-03E) covering the remediation of the remaining 300-FF-1 waste sites (current baseline schedule + nine months). EPA could not agree to the proposed nine month extension

(M-16-03E) which would allow for potential delays, based on previous experience remediating the 300-FF-1 OU to date. DOE has re-written the proposed milestone date for M-16-03E for December '00. The proposal is being reviewed internally and DOE expects to submit it to EPA within the next few weeks.

5. <u>618-4 Burial Ground Drummed Waste Treatment and Disposal Plan</u> – The 618-4 Burial Ground Waste Treatment and Disposal Plan was presented to DOE and BHI management on March 17, 1999 and will be issued within a week (March 21-25). The plan recommends the use of a solidification technology called Petroset. This method will require an EPA variance because the technology is not an acceptable treatment method for organic compounds. EPA will review the request for a variance after it as received the 618-4 Burial Ground Waste Treatment and Disposal Plan.

Attachment 4

Activity Description	Ver Pkg	Early Start
REG REVIEW OF VERIFICATION PACKAGE / 116-C-1	V	21JAN99*
REG REVIEW OF VERIFICATION PACKAGE / 1607-D2	V	18FEB99*
REG REVIEW OF VERIFICATION PACKAGE / 107-D3	V	18FEB99*
REG REVIEW OF VERIFICATION PACKAGE / 107-D5	V	18FEB99*
REG REVIEW OF VERIFICATION PACKAGE / 107-D2	V	18FEB99*
REG REVIEW OF VERIFICATION PACKAGE / 107-D1	V	18FEB99*
REGULATOR APPROVAL TO BACKFILL / 1607-D2		19FEB99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-13	V	09APR99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-14	V	09APR99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-11	V	16APR99*
DRAFT A 100 AREA BURIAL GROUNDS FFS		22APR99*
REG REVIEW OF VERIFICATION PACKAGE / 1607-D2	V	12MAY99*
REG REVIEW OF VERIFICATION PACKAGE / 116-C-5	V	19MAY99*
ISSUE ROD / TSD		28MAY99*
ISSUE ROD / 100-NR- 1/2		28MAY99*
ISSUE ROD / 100 AREA REMAINING SITES		28MAY99*
REG REVIEW OF VERIFICATION PACKAGE / 116-D-7	V	16JUN99*
REG REVIEW OF VERIFICATION PACKAGE / 116-D-7	V	30JUN99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-1	V	01JUL99*
DRAFT A 100 AREA BURIAL GROUNDS PROPOSED PLAN		08JUL99*
SAP REVIEW / 100-NR-1 TSD SITES REMEDIAL DESIGN		15JUL99*
FINAL FFS / 100 AREA BURIAL GROUNDS		26JUL99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-10	V	29JUL99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-9	V	02AUG99*
RDR/RAWP REVISION REVIEW / GROUP 5		04AUG99*
CSE SAP REVIEW / GROUP 5		04AUG99*
100 AREAS SAP REVISION REVIEW		04AUG99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-12	V	10AUG99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-3	V	10AUG99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-6B	V	13AUG99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-16	V	17AUG99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-4	V	20AUG99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-6A	V	27AUG99*
REV 0 100 AREA BURIAL GROUNDS PROPOSED PLAN		14SEP99*
REG REVIEW OF VERIFICATION PACKAGE / 116-C-2B	V	27SEP99*
REG REVIEW OF VERIFICATION PACKAGE / 116-DR-9	V	30SEP99*
REG REVIEW OF VERIFICATION PACKAGE / 116-C-2A	V	01OCT99*
RDR/RAWP REVIEW / 100-NR-1 TSD SITES REM DESIGN		01OCT99*
REG REVIEW OF VERIFICATION PACKAGE / 116-B-2	V	05OCT99*
REG REVIEW OF VERIFICATION PACKAGE / 116-C-2C	V	12OCT99*



Project Start 01OCT98
Project Finish 26OCT99
Data Date 01OCT98
Run Date 18MAR99

Early Bar
Progress Bar
Critical Activity

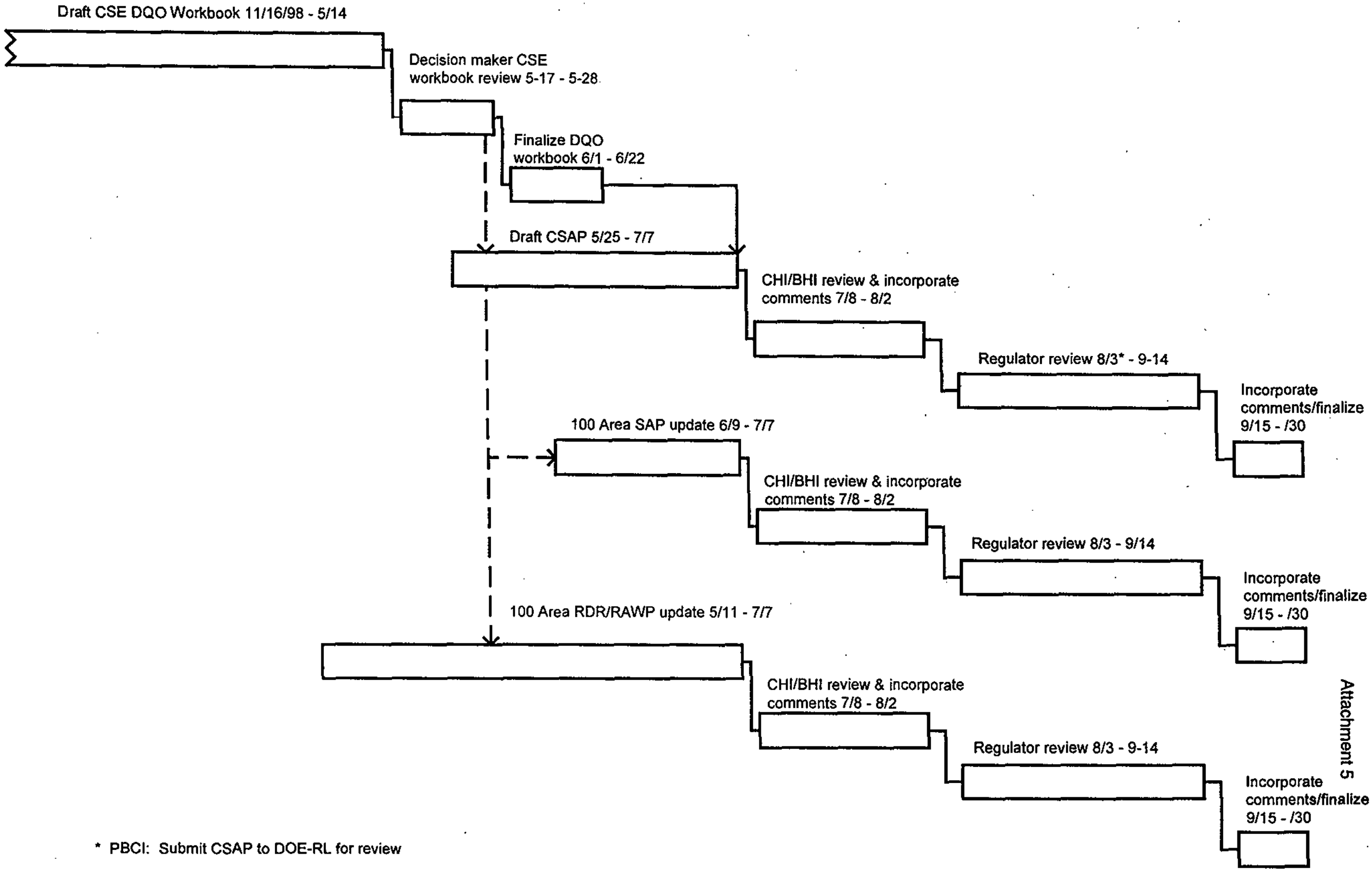
REGR

Sheet 1 of 1

RA Regulator Review Dates

100 AREA

Integration of Group 5 Remedial Design with 100 Area SAP/RDR
Block Diagram/Summary Schedule



* PBCI: Submit CSAP to DOE-RL for review

Attachment 5

100 AREA PIPELINE EVALUATION
STRATEGY FOR REMEDIAL DECISIONMAKING

Issue:

Milestone M-15-00A requires completion of all remaining 100 Area Operable Unit pre-ROD site investigations under approved work plan schedules (100-KR-2, 100-KR-3, 100-FR-2, 100-IU-2, AND 100-IU-6). by 12/31/1999. The practical application of the milestone by EPA and Ecology is the requirement to address all 100 Area waste sites in a Proposed Plan by the milestone date. A strategy to ensure that pipeline remediation in the 100 Areas will meet this milestone is presented below.

Background:

The remaining pipelines and associated potentially contaminated soil and debris that have not already been specifically addressed in the *Proposed Plan for Interim Remedial Actions at the 100 Area Remaining Sites* (Proposed Plan), the September 1995 ROD or the April 1997 ROD Amendment will require remediation if contaminants represent an unacceptable risk to human health or the environment. The large cooling water effluent pipelines in the ROD and ROD Amendment have been included in the remediation planning. However, the majority of other underground piping, particularly chemical pipelines is not associated with a ROD. The Proposed Plan did not include these pipelines (although some Remaining Sites specifically indicate the piping is associated with the site); however, some were identified in the planning stages of this Proposed Plan as entities that would be required to be evaluated in the future: 100-B-7, 100-C-5, 100-D-50, 100-F-26, 100-H-28, 100-K-47, and 100-K-60.

Resolution:

The preferred alternative identified in the Proposed Plan for the Remaining Sites describes a process for remediating sites using the remove/treat/dispose remedy without the need to revisit the site through an additional CERCLA feasibility study/proposed plan/ROD process. This process, which is expected to be selected in the Remaining Sites ROD, is called the Plug-in Approach. It is proposed that all remaining 100 Area pipelines that have not been identified in a previous CERCLA decision document be evaluated for remediation following this approach.

In order to take advantage of the Plug-in Approach, all remaining pipelines would be addressed as "discovery 100 Area sites" in the manner described in the Proposed Plan which is based on the Tri-Party Agreement Handbook Management Guideline MP-14. The process begins with identification of particular pipeline segments as "discovery sites" in the Waste Information Data System (WIDS). Newly discovered sites are categorized as "accepted" or "rejected" in WIDS. As described in the Proposed Plan, sites that are accepted in WIDS can be "plugged-in" to the remove/treat/dispose remedy where they are determined to share a similar site profile with 100 Area Remaining Sites (i.e., share similar contaminants and contaminated environmental media or waste material) and where contamination is above unacceptable risk levels. Some pipelines are currently identified as sites in the Waste Information Data System (WIDS). These identifications represent large groupings of pipelines which may not necessarily correspond to a "site" requiring remediation or may represent a number of different remediation strategies, e.g., sampling sites; known contamination; unknown locations. It is proposed that these pipeline groups be reclassified under WIDS, where appropriate, and also defined as discovery sites.

The Tri-Parties will notify the public regarding the decision to plug-in newly discovered waste sites through the periodic publication of fact sheets or Explanations of Significant Differences. If these sites are RCRA corrective action sites (RPP), they will then be incorporated into the Hanford Facility RCRA Permit.

Conclusion:

Milestone M-15-00A will be met through the identification of remaining pipelines as discovery sites that will be plugged-in to the Remaining Sites ROD selected remedy if it is determined that they meet the site profile and exceed cleanup levels identified in that remedy.

Actions:

Pipeline remediation will need to take into account many different variables that will define the scope and prioritization of remediation. Defining pipelines as newly discovered sites would allow remediation of pipelines to be undertaken as part of an overall strategy that will address these variables. Categorization of all pipelines to be remediated and the recategorization of pipelines currently within WIDS would benefit this overall strategy. The process for this categorization will require further analysis of the problems that are to be encountered in remediating these pipelines and will require further discussions with the regulatory agencies.

Should the Tri-Parties wish to document this proposed determination, the 100 Area Remaining Sites ROD could include language indicating that the remaining 100 Area pipelines will be identified as discovery sites. This insertion would establish compliance with Milestone M-15-00A and would commit to actions necessary for the eventual remediation of the pipelines.

Suggested language under Section X. Selected Remedy activities is as follows:

> "All pipelines associated with 100 Area Remaining Sites or other 100 Area buildings and structures not otherwise specified in Appendix # of this ROD or in the 1995 ROD or 1997 ROD Amendment, will be defined as discovery sites that are to be accepted or rejected as waste sites. Accepted waste site are to be categorized or recategorized using the process determined in the Tri-Party Agreement Handbook Management Guideline MP-14. The categorization of

pipelines, singularly or grouped according to like criteria, will occur after further evaluation is performed to determine and resolve problems associated with remediation of these pipelines. Where discovery sites are determined to fit the site profile and require remedial action (through process knowledge or sampling), these sites will be determined to plug-in to the remove/treat/dispose remedy established in this ROD. The public will be notified of these determinations through the publication of an Explanation of Significant Difference to this ROD."

DRAFT

Test Plan for Determination of Distribution Coefficient and Leachability of Hexavalent Chromium in 100 Area Hanford Formation Soils

March 17, 1999

CONTENTS

APPENDICES

Figures

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ACRONYMS

ASTM	American Society for Testing and Materials
EIP	Environmental Investigation Procedure
ERC	Environmental Restoration Contractor
K_d	distribution coefficient
ORP	oxidation reduction potential
RARA	Radiation Area Remedial Action
RESRAD	RESidual RADioactivity dose model
RPD	relative percent difference

1.0 INTRODUCTION

This document describes the process, procedures and testing that will be conducted during bench-scale testing designed to determine a hexavalent chromium soil/water distribution coefficient (K_d) and leachability of hexavalent chromium in the Hanford Site's 100 Areas soils where site-specific information does not currently exist. Samples used for testing will be obtained from the 100-D Area, and applicability of the test results to individual sites in the 100 Areas will be determined on a case-by-case basis. This document is organized as follows:

- Introduction, including background project information and test objectives
- Scope and design of the testing
- Field sample collection
- Existing total and hexavalent chromium data for the 116-D-7 retention basin
- Data management.

1.1 BACKGROUND

The available literature provides broad and varied descriptions of mechanisms and conditions that affect the mobility of metals in soils, and as a result, a complex relationship emerges for each metal at each location. Metals exist within soils as either free metal ions, in soluble complexes with inorganic or organic ligands, or associated with mobile inorganic and organic colloidal material. Hexavalent chromium is typically present in soils as chromate ion $HCrO_4^-$ (soil pH <6.5) or CrO_4^{2-} (soil pH ≥6.5), or as dichromate ion $Cr_2O_7^{2-}$ (soil pH ≥6.5) at higher concentrations (EPA 1992). Because of the anionic nature of hexavalent chromium, its association with soil surfaces is limited to positively charged exchange sites, the number of which decreases with increasing soil pH. Stollenwerk and Grove (1985) found that hexavalent chromium adsorption was due in part to the presence of iron oxides and hydroxides within alluvial particles, but that hexavalent chromium was readily desorbed with the input of uncontaminated water. Korte et al. (1976) found that hexavalent chromium was mobile in alkaline soils. Parameters that correlated with hexavalent chromium immobility were free iron oxides, total manganese, and soil pH, whereas soil properties, surface area, and percent clay had no significant effect on hexavalent chromium mobility. It has been shown that organic matter can act as an electron donor in the redox reaction of hexavalent/trivalent chromium (Bartlett and Kimble 1976; Bloomfield and Pruden 1980) and that the reaction rate for the reduction in Cr^{+3} increases with decreasing soil pH (Cary et al. 1977; Bloomfield and Pruden 1980). It is also possible that the hexavalent chromium found in sediment is present as an insoluble precipitate as opposed to being adsorbed on surface exchange sites.

The K_d is defined as the ratio of soil concentration to water concentration at equilibrium. The K_d represents a number of different mechanisms affecting the distribution of the contaminant, of which only sorption (i.e., adsorption and ion exchange) is typically addressed through short-term testing (ASTM 1993; ASTM 1987). To date, only K_d (and not leachability) has been used to evaluate groundwater impact using the RESidual RADioactivity dose model (RESRAD). RESRAD also has a computation feature to evaluate groundwater impact from residual vadose soil contaminant concentrations, utilizing *leachability* parameters, which represent desorption of contaminated soils with the introduction of water. Given the multiple mechanisms available for hexavalent chromium adsorption/desorption and/or solubility/precipitation in soil, as well as the wide range of K_d values currently published in literature, specific testing of hexavalent chromium mobility in soil underlying former 100 Areas waste sites is warranted.

A proposed source of contaminated material to be used for testing is the 116-D-7 retention basin site, located north of the 100-DR-1 Operable Unit at the Hanford Site. The basin was an open concrete structure with a vertical concrete wall lengthwise down the middle of the basin and wood and concrete baffles to control flow through the basin. Between 1944 to 1967, the site received large quantities (the exact amount is unknown) of process effluent water contaminated with radionuclides, process and water treatment chemicals to allow for thermal cooling and decay prior to discharge to the Columbia River. The basin is known to have had extensive leaks throughout its period of usage. Sodium dichromate was used for corrosion control by addition to the cooling water and also used for cleaning as chromic acid. After operations ceased in 1967, the site was decommissioned as part of the Radiation Area Remedial Action (RARA) Program. The upper portion of the basin's side walls, center structure, and baffles were knocked down into the basin and the entire site was stabilized with 0.6 to 1.2 m (1 to 2 ft) of overburden soil.

The 116-D-7 site and underlying vadose zone (i.e., unsaturated soils above the groundwater table) consist of material from the Hanford Formation. The Hanford Formation consists predominantly of medium-dense to dense sand and gravel, with various degrees of silt and cobble-sized material. The long-term groundwater depth beneath the site is estimated at 13.4 m (44 ft) below the bottom of the remedial action excavation. The site is located approximately 190 m (626 ft) from the 100-year flood level of the Columbia River.

The basin is currently being remediated as part of the Group 2 Remedial Action Project. The excavation of previously placed overburden backfill and the removal and disposal of the 116-D-7 engineered structure were completed in 1998. The remaining soil beneath the removed structure was sampled to determine if remedial action goals had been achieved. Hexavalent chromium was found at concentrations ranging from 0.8 mg/kg to 18 mg/kg (see Appendix A). RESRAD modeling indicates a potential impact to groundwater from these soils, assuming a hexavalent chromium K_d value of zero. Additional excavation-at-depth is in progress to remediate these soils. Similar conditions of elevated hexavalent chromium concentrations (relative to a K_d of 0) are anticipated at other 100-D Area sites.

The *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 1998) conservatively specifies a K_d value of 0 (zero) for hexavalent chromium, but a K_d range from 1.2 to 1800 is indicated based on the results of a literature search. The available K_d data for hexavalent chromium in this reported range is neither specific for the 100-D Area, nor the 100 Areas, in general. Leach rates, in general, are not as readily available in the literature and have not been pursued to date. Important decisions affecting the cost and extent of remedial action are currently based on a very conservative value. The determination of area-specific K_d and leach rates will provide a more accurate picture of actual potential impacts to ground water and support future remedial action cleanup goals and planning.

1.2 TEST OBJECTIVES

The primary objectives of this test are to:

1. Determine a K_d for hexavalent chromium specific to Hanford Formation soils found throughout the 100 Areas.

The use of K_d to represent partitioning between soil and water is considered valid if the isotherm is linear over the range of concentrations present in the field (both soil and water). This test is designed to acquire at least three data points to evaluate whether a constant K_d with changing hexavalent chromium concentrations is found. Literature indicates that over six different chemical reactions can effect contaminant distribution and curvilinear isotherms with empirical solutions commonly used for K_d modeling (EPA 1992).

2. Determine a leach rate for hexavalent chromium specific to contaminated soils found in the Hanford Formation throughout the 100 Areas.

A secondary objective of this testing is to evaluate for total chromium, on a mass balance basis to determine what, if any, of the hexavalent chromium is converted to the trivalent form as a result of the process.

To achieve these objectives, the testing will utilize a combination of batch equilibrium tests (with clean soils exposed to water spiked with hexavalent chromium) and column testing (with pre-existing hexavalent chromium contaminated soils) to generate the necessary data.

The data collected from the batch testing with clean soils exposed to water spiked with hexavalent chromium will be used to plot an isotherm of the hexavalent chromium concentrations in soil and water. A linear plot will confirm the appropriateness the use of a singe partition coefficient (K_d) over the range of interest. The averaged soil/water concentration ratios will be reported as the K_d for these soils. Due to the difficulty and highly variable results of soil analyses, the soil concentrations will be determined by mass balance using "before" and "after" water analyses. Analysis for total chromium and hexavalent chromium will be performed to determine what percent, if any, of the hexavalent chromium is converted to the trivalent form as a result of the process.

Column testing will be run to determine the leach rate of soil contaminated with hexavalent chromium using a flow rate equivalent to rainfall plus irrigation. Samples will be taken over designated time intervals to establish the concentration of chromium in the effluent with time and soil pore volumes eluted. A mass balance analysis will be performed using initial concentrations of soil and water and continuing analyses of column effluent for total chromium and hexavalent chromium. A final leach rate will be determined based on the data collected. Analysis for total chromium and hexavalent chromium will be performed to determine what percent, if any, of the hexavalent chromium is converted to the trivalent form as a result of the process.

2.0 SCOPE AND DESIGN

The scope of the testing will be limited to determining a 100 Areas Hanford Formation hexavalent chromium K_d and leach rate. The design of the test takes into consideration the range of contamination typically encountered in the field. The processing of soil samples prior to testing is intended to result in material similar to the material that is used for closeout samples.

2.1 BATCH EQUILIBRIUM TESTING

The batch equilibrium testing method applies to situations in which only sorptive processes (i.e., adsorption and ion exchange) are operable for the species of interest and are considered to be the main mechanisms of concern. Batch testing will be used to acquire a minimum of three data points for each concentration to develop a plot of the data (i.e., isotherm). The isotherm will demonstrate the relationship between the soil and aqueous concentrations. The data will be evaluated to verify that the relationship of the partition coefficient over the range of concentration is independent of concentrations. The resulting K_d factor (assuming a linear relationship) will be reported as a 100 Areas Hanford Formation value. In the event of a non-linear relationship, the data will be evaluated for consideration of using concentration specific values.

Batch testing will consist of combining a measured weight of uncontaminated soil with a measured quantity of spiked water to a standard laboratory container, fully immersing the soil at a ratio of 1:4 (soil/water). The soil or water may contain trace levels of chromium and will need to be evaluated for background levels for corrections to the final calculations. The batch test container is typically agitated/mixed to ensure full and continuous contact between the soil particles and water. Samples are taken at discrete time intervals for analysis of the contaminant of interest. The analytical results are monitored, and the test is concluded when sample results are relatively unchanged from one time to the next. At this point, the concentration of the contaminant in the soil is at equilibrium with the contaminant in the water. The sample data can be plotted to show the time required to reach equilibrium conditions. Once the time of equilibrium is established, the remainder of the data for each concentration will be evaluated for linearity. Due to the difficulty and highly variable results of soil analyses, the soil concentrations will be calculated by difference based on changes in concentrations of the water samples.

The water used will typify uncontaminated groundwater of the 100-HR-3 Operable Unit (uncontaminated portion of the groundwater unit underlying the 100-DR-1 Operable Unit) or natural precipitation. It is assumed that the pH and mineral content of this water will be consistent with previously collected samples.

2.1.1 Preliminary Screening

Preliminary screening will consist of 50 g samples and 200 mL of spiked reagent water. The preliminary screening will evaluate the process to provide information on the 5 concentrations that should be evaluated and the time intervals for testing. If this screening process shows the K_d to be 0.5 or less, the formal batch testing procedure will not be continued.

2.1.2 Batch Test Setup

An initial weight of 10 kg of uncontaminated soils will be run through a soil splitter to acquire more representative and consistent subsamples. The material used for batch testing (passing a # 4 sieve) will be acquired through additional sieving of enough of the split material. Initial testing of the uncontaminated soil will include the following:

- Wet sieve analysis after initial splitting (percentage of material retained/passing a series of sieves: 4, 10, 20, 40, 60, 100,140, and 200 mesh)
- Moisture content (after passing # 4 sieve)
- Soil pH (50/50 mix with deionized water after 30 minutes of contact)
- Conductivity (50/50 mix with deionized water after 30 minutes of contact)
- Alkalinity (50/50 mix with deionized water after 30 minutes of contact)
- Oxidation reduction potential (ORP) (50/50 mix with deionized water after 30 minutes of contact)
- Total chromium – acid digestion
- Hexavalent chromium – alkaline extraction.

Prior to batch testing, the sieved soils will be equilibrated in uncontaminated groundwater twice for a period of 24 hours. The samples will be centrifuged after each equilibration, to remove as much of the groundwater as possible. The amount of residual unspiked groundwater will be measured gravimetrically so that the small dilution, after spike addition, can be quantified.

Batch test will consist of subsamples of approximately 50 g to wide-mouth ,250-mL plastic containers known to not adsorb metals (high-density polyethylene, or equivalent) for each testing period in the batch test matrix (see Appendix B). All samples will be set up in triplicate. Accurate weights (nearest 0.1 g) and volumes (closest 0.1 mL) will be recorded on data sheets or in logbooks. Each container will then receive 200 mL of groundwater spiked with different levels of hexavalent chromium and the cap will be securely attached. Five different concentrations, as determined from initial screening, will be used in the batch testing. Groundwater will be spiked at a minimum volume of 2 L at a time from a stock solution of 1,000 mg/L hexavalent chromium. The stock solution will be made up from reagent-grade sodium dichromate and will be checked against accepted analytical standards. Spiked solutions will be checked for pH and adjusted back to original groundwater levels if not within 0.1 units of the original measurements.

Initial testing of the unspiked groundwater will consist of the following:

- pH
- Conductivity
- Alkalinity
- ORP
- Total chromium
- Hexavalent chromium
- Major cations
- Major anions.

Sample containers will be well marked to represent each time period and sample shown in the batch test matrix. Due to the difficulty and highly variable results of soil analyses, only the water phase of the batch testing will be analyzed. Final soil concentrations will be calculated using mass balance rather than being determined analytically, directly on the soils.

Each container will be mixed for 2 hours each day in a laboratory shaker/rotator. At the end of the assigned time periods, the samples will be allowed to settle, and an aliquot sufficient for the metals analyses will be decanted off and centrifuged at 1,400 g for 20 minutes. The resulting liquid will then be filtered using a 0.45-micron membrane filter and analyzed for total and hexavalent chromium. The remaining liquid will be tested for parameters other than metals (pH, conductivity, ORP).

2.1.3 Batch Test Sampling and Analysis Requirements

As a minimum level of analysis, the first data set will be compared with the next two data sets to determine if the various concentrations have reached equilibrium. If equilibrium has not been reached, the next data set will be processed at the assigned time and will be analyzed and compared to the previous data. This process will continue until at least three data points representing equilibrium conditions for each concentration have been established, or until the last set has been processed. Table 1 summarizes the sampling requirements and analytical parameters for batch test sampling.

Table 1. Batch Test Sampling Requirements.

Analyte	Frequency of Sample
Soils Analyses Required	
Wet sieve analysis	Split soils
Moisture	Split soils (in triplicate)
PH	Split soils (in triplicate)
ORP	Split soils (in triplicate)
Conductivity	Split soils (in triplicate)
Alkalinity	Split soils (in triplicate)
Cr^{+6}	Split soils (in triplicate)
Total chromium	Split soils (in triplicate)
Major cations	Split soils (in triplicate)
Major anions	Split soils (in triplicate)
Water Analyses Required	
pH (water)	Initial characterization All batch tests Soil blanks Equilibrium samples
Conductivity (water)	Initial characterization All batch tests Soil blanks Equilibrium samples
ORP	Initial characterization All batch tests Soil blanks Equilibrium samples
Cr^{+6} (water)	Initial characterization All batch tests Soil blanks Equilibrium samples Container blanks
Total chromium (water)	Initial characterization All batch tests Soil blanks Equilibrium samples Container blanks
Major cations (water)	Initial characterization Soil blanks
Major anions (water)	Initial characterization Soil blanks

2.1.4 Batch Test Quality Control Requirements

All soils metals testing (total and hexavalent chromium) will be performed in triplicate using different aliquots. If the values vary by more than 30% relative percent difference

(RPD), as determined by the following formula, the analyses will be repeated until the 30% RPD precision is obtained.

If calculated from duplicate measurements:

$$RPD = \frac{(C_1 - C_2) \times 100}{(C_1 + C_2)/2}$$

where: RPD = relative percent difference
C_1 = larger of the two observed values
C_2 = smaller of the two observed values.

If calculated from three or more replicates, use relative standard deviation rather than RPD:

$$RSD = (s/\bar{y}) \times 100 \quad (2)$$

where: RSD = relative standard deviation
s = standard deviation
$\bar{y}$ = mean of replicate analyses.

The standard deviation, s, is defined as follows:

$$s = \sqrt{\sum_{i=1}^{n} \frac{(y_i - \bar{y})^2}{n-1}} \quad (3)$$

where: s = standard deviation
y_i = measured value of the i^{th} replicate
$\bar{y}$ = mean of replicate measurements
n = number of replicates.

Soil blanks will consist of three 50 g aliquots in the same size bottles, with 200 mL of deionized water added. Container blanks will consist of 200 mL of each concentration used in the test, which will be added to the same size container. The container blanks will be analyzed at the end of the testing.

An evaluation of the effect of the soil/water ratio will be performed on the middle concentration of spiked water by adding additional containers with 25 g soil and 200 mL water (1:8 ratio), and 75 g soil with 150 mL water (1:2 ratio). These containers will be analyzed with the last set of samples (i.e., the third data point after reaching equilibrium).

A minimum of one duplicate sample, matrix spike, and matrix spike duplicate will be analyzed for each sample group or 5%, whichever is more frequent. A minimum of one matrix spike and one matrix spike duplicate will be analyzed for each matrix or 5%, whichever is more frequent. In addition, a minimum of one method blank and control standard will be analyzed per sample group or 5%, whichever is more frequent, to verify system control

All quality control samples analyzed during batch testing are applicable to column testing.

2.2 COLUMN TESTING

Column testing consists of packing a vertical column with a measured amount (weight and volume) of soil and allowing a constant source of water to flow through the column at a constant rate. The flow is from bottom to top to minimize air entrapment and channeling. The amount of water that percolates through the soil is monitored and compared to the pore volume. The column effluent is sampled at discrete intervals in relation to the number of pore volumes passed through the soil. The sample data can be plotted with the time or volume of water to create a plot showing leach rate or cumulative mass leached. The distribution coefficient (i.e., the K_d determined during batch testing) can be related by comparing the effluent concentration, pore volumes, contact time, and remaining soil concentration after the system has stabilized and is no longer leaching. Final soil concentrations will be calculated using mass balance rather than being determined analytically, directly on the soils.

2.2.1 Column Test Setup

Flow through column leach testing will be conducted on contaminated soil using uncontaminated water. The column test will be used to graph the desorption curve (i.e., leach rate) and to estimate the soil pore volumes required for complete hexavalent chromium desorption. A single column test will be conducted to provide data points for evaluating the hexavalent chromium leach rate.

The initial concentration of the contaminated soil will be within the range typically encountered in the field. Flows during column leach testing will be at the flow rate equivalent to 914 mm (36 in.) of water per year to represent rainfall (6 in.) plus irrigation (30 in.). Leachate will be collected in small aliquots at a minimum of one sample per pore volume. Each aliquot will be analyzed so the hexavalent chromium and co-constituents can be tracked. The column test will continue until leaching is no longer occurring or the system has come to equilibrium. Final soil concentrations will be calculated using mass balance rather than being determined analytically, directly on the soils.

Prior to any testing, an initial weight of 20 kg of contaminated soils (as received) will be run through a soil splitter to acquire a more representative and consistent subsample. The material used for packing the column (passing a #4 sieve) will be acquired through additional sieving of a sufficient quantity of the split material. Initial testing of the contaminated soil will include the following:

- Wet sieve analysis after initial splitting (percentage of material retained/passing a series of sieves: 4, 10, 20, 40, 60, 100,140 and 200 mesh)
- Moisture content (after passing #4 sieve)
- Soil pH (50/50 mix with deionized water after 30 minutes of contact)
- Conductivity (50/50 mix with deionized water after 30 minutes of contact)
- Alkalinity (50/50 mix with deionized water after 30 minutes of contact)
- ORP (50/50 mix with deionized water after 30 minutes of contact)
- Total chromium – acid digestion
- Hexavalent chromium – alkaline extraction.

Some testing will be performed in triplicate using different aliquots (see table 2). If the values vary by more than 30% RPD, as determined by the previous formula, the analyses will be repeated until the 30% RPD precision is obtained.

The soil column will be 38-mm diameter by 241-mm deep (275-mL) contained in glass or inert plastic containers. Pore volume will be measured gravimetrically by the weight difference between the packed and fully saturated column. The pumping rate is calculated for the column based on the desired annual application of 36 in. as applied to the surface area of the soil column on a daily basis. A 38-mm diameter column, 914-mm tall represents a volume of 1,037 mL. Using a 365-day year, this is equivalent to 2.8 mL applied each day. At this rate the first pore volume (assumed to be 38%) would take 37 days to elute. To speed up the process, the flow rate will be increased about 10 times the annual infiltration rate to equal a column residence time of 4 days.

All liquid will be collected and volumetrically measured for analysis and calculation of mass balance. The first pore volume will be collected in roughly 25% increments (if the pore volume = 500 mL – collect 125 mL at a time). The next four pore volumes will be collected at twice the initial volume (e.g., 250 mL), and the remainder of the samples will represent a single pore volume. Samples will be filtered prior to analysis with 0.45-micron membrane filters. These filters will have been shown to have no effect on total or hexavalent chromium.

2.2.2 Column Test Sampling Requirements

Prior to column testing, all soil and water will be sampled to determine the initial levels of contaminants and characteristics, if data are not already available. Table 2 summarizes the sampling requirements and analytical parameters for column test sampling.

Table 2. Column Test Sampling Requirements.

Analyte	Frequency of Sample
Soils Analyses Required	
Sieve analysis	Split soils
Moisture	Split soils (in triplicate)
PH	Split soils
ORP	Split soils
Conductivity	Split soils
Alkalinity	Split soils
Cr^{+6}	Split soils (in triplicate)
Total chromium	Split soils (in triplicate)
Major cations	Split soils (in triplicate)
Major anions	Split soils (in triplicate)
Water Analyses Required	
PH	Initial characterization Pore volume samples
Conductivity	Initial characterization Pore volume samples
ORP	Initial characterization Pore volume samples
Cr^{+6}	Initial characterization Pore volume samples
Total chromium	Initial characterization Pore volume samples
Major cations	Initial characterization Pore volume samples
Major anions	Initial characterization Pore volume samples

2.2.3 Column Test Quality Control Requirements

A minimum of one duplicate sample, matrix spike, and matrix spike duplicate will be analyzed for each sample group or 5%, whichever is more frequent. A minimum of one matrix spike and one matrix spike duplicate will be analyzed for each matrix or 5%, whichever is more frequent. In addition, a minimum of one method blank and control standard will be analyzed per sample group or 5%, whichever is more frequent, to verify system control.

All quality control samples analyzed for column testing are applicable to batch testing.

3.0 FIELD SAMPLE COLLECTION

To obtain the most representative contaminated and uncontaminated soil for the test, actual soil from the site will be collected from the pre-established sampling grid. Uncontaminated soil should be free of chromium above background levels but may contain trace levels of constituents typically found within the deep zone (greater than 4.6 -m deep) soils. Rock and cobble should typify the natural geology, provided that these items are compatible with laboratory equipment.

Water used during testing will consist of uncontaminated water from the 100-HR-3 groundwater unit aquifer. This is based on the assumption that water entering the vadose soil will have been conditioned with these minerals and ions as the water percolates downward into the contaminated zone.

Sampling will follow standard operating procedures per BHI-EE-01, *Environmental Investigations Procedures*. Sample container requirements will be specified on a Sample Authorization Form in accordance with BHI-EE-01, Procedure 2.0, "Sample Event Coordination." Sample preservation will rely upon cold storage, and the addition of chemicals will not be permitted. Samples will be packaged in accordance with BHI-EE-01, Procedure 3.1, "Sample Packaging and Shipping," and will be sent directly to the laboratory to minimize holding times. Samples will be managed in accordance with applicable Environmental Restoration Contractor procedures. Samples will be controlled from the point of origin as required by BHI-EE-01, Procedure 3.0, "Chain of Custody." The sample event and pertinent details will be recorded in the project field logbook.

3.1 SOIL SAMPLE REQUIREMENTS

To the degree possible, soils should typify those found at the site. All samples shall be completely homogenized prior to use. Rock and cobble size should not exceed 64 mm (2.5 in.) to be compatible with laboratory equipment. If available, field screening shall be used to aid in identifying the contamination within the ranges specified in Table 3. Table 3 also summarizes the size of sample and typical constituent levels.

Table 3. Soil Sample Requirements[a]

Sample Type or Intended Use	Amount Required	Constituent Levels	Likely Location at 116-D-7
Uncontaminated batch sample	20 kg	Cr^{+6}: ND Total Cr: ≤18.5 mg/kg	Overburden
Contaminated (leaching column sample	20 kg	Cr^{+6}: 25 mg/kg Total Cr: >500 mg/kg	Sample Area C8

[a]These requirements represent ideal circumstances and may not be feasible due to logistical constraints.
ND = nondetect

3.2 WATER SAMPLE REQUIREMENTS

To the degree possible, uncontaminated water should typify natural precipitation that has percolated through the upper 4.6 m (15 ft) of soil above the contaminated zone. This type of water may be obtained from uncontaminated well water. Quarterly groundwater sample records should be consulted to confirm the absence of hexavalent chromium from groundwater wells.

4.0 QUALITY CONTROL REQUIREMENTS

A minimum of one duplicate sample, matrix spike, and matrix spike duplicate will be analyzed for each sample group or 5%, whichever is more frequent. A minimum of one matrix spike, and matrix spike duplicate will be analyzed for each matrix or 5%, whichever is more frequent. In addition, a minimum of one method blank and control standard will be analyzed per sample group or 5%, whichever is more frequent, to verify system control.

To achieve the test objectives, minimum data quality requirements have been established for samples and their associated analysis (Table 4).

Table 4. Sample Analysis Requirements

Analyte (Matrix)	Detection Limit	Percent Recovery	Relative Percent Difference	Preferred Analytical Method
Sieve analysis (soil)	230 mesh	NA	NA	ASTM D 422 and ASTM D 2217
Moisture (soil)	0.1%	NA	30	ASTM D 2216
pH (soil)	0.1 Units	NA	30	9045C, SW-846, Ch. 6
ORP (soil)	NA	NA	30	Pt/Calomel electrode
Conductivity (soil extract)	10 uS/cm	NA	30	9050A, SW-846, Ch. 6
Alkalinity (soil extract)	5 mg/L as $CaCO_3$	NA	30	301.1, 600/4-79-020
Alkaline extraction for Cr^{+6}	NA	NA	NA	3060A, SW-846
Cr^{+6} (soil extract)	0.050 mg/kg	70-130	30	7196A, SW-846, Ch. 3.3
Acid digestion – total soil	NA	NA	NA	3050A, SW-846, Ch. 3.2
Total chromium (soil digestion)	0.005 mg/kg	70-130	30	7190, SW-846, Ch. 3.3
Major cations (soil digestion)	0.050mg/kg	70-130	30	0200.7, 600-R-94-111
Major anions (soil extract)	0.1 mg/kg	70-130	30	9056, SW-846, Ch. 5
pH (water)	0.1 Units	NA	20	9040B, SW-846, Ch. 8.2
Alkalinity (water)	5 mg/L	NA	20	301.1, 600/4-79-020
Conductivity (water)	10 uS/cm	NA	20	9050A, SW-846, Ch. 6
ORP (water)	NA	NA	20	Pt/Calomel electrode
Cr^{+6} (water)	0.005 mg/L	80-120	20	7196A, SW-846, Ch. 3.3
Acid digest – total water	NA	NA	NA	3005A, SW-846, Ch. 3.2
Total chromium (water digestion)	0.005 mg/L	80-120	20	7190, SW-846 Ch 3.3
Major cations (water digestion)	0.01 mg/L	80-120	20	0200.7, 600-R-94-111
Major anions (water)	0.01 mg/L	80-120	20	9056, SW-846, Ch. 5

NA = not applicable
References for SW-846 were obtained from EPA 1979.

5.0 REFERENCES

ASTM, 1993, *Standard Test Method for Distribution Ratios by the Short-Term Batch Method*, ASTM D 4319–93, American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1987, *Standard Test Method for 24-h Batch-Type Measurement of Contaminant Sorption by Soils and Sediments*, ASTM D 4646 – 87, American Society for Testing and Materials, Philadelphia, Pennsylvania.

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Bloomfield, C., and G. Pruden, 1980, "The Behavior of Cr(VI) in Soil Under Aerobic and Anaerobic Conditions," *Environmental Pollution Series A.*, 103-114.

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EPA, 1979, *Methods for Chemical analysis of Water and Wastes*, EPA-600/4-79-020, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

EPA, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, 3rd edition, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1992, *Ground Water Issue: Behavior of Metals in Soils*, EPA-540/S-92/018, Office of Research and Development, Office of Solid Waste and Emergency Response, US Environmental Protection Agency, Washington, D.C.

Korte, N. E., J. Skopp, W. H. Fuller, E. E. Neibla, and B. A. Aleshi, 1976, "Trace Element Movement in Soils: Influence of Soil Physical ad Chemical Properties," *Soil Science*, 122:350-359.

Stollenwerk, K. G., and D. B. Grove, 1985, "Adsorption and Desorption of Hexavalent Chromium in an Alluvial Aquifer Near Telluride, Colorado," *Journal of Environmental Quality*, 14:150-155.

APPENDIX A

116-D-7 RETENTION BASIN ANALYTICAL DATA

Table A-1. 116-D-7 Hexavalent Chromium and Total Chromium Analytical Results.

Sample Location	Sample Number	Cr^{+6} (mg/kg)	Total Chromium (mg/kg)	Notes
A1	B0PK25	1.3	117	
A2	B0PK19	2.9	153	
A3	B0PK24	0.80 U	144	
B4	B0PK17	0.80 U	226	
B5	B0PK23	8.5	339	
B6	B0PK21	0.80 U	131	
C7	B0PK26	1.4	117	
C7	B0PK27	3.0	142	Duplicate of B0PK26
C7	B0PK16	5.89	209	Split of B0PK26
C8	B0PK20	18.0	152	
C9	B0PK18	3.8	90.9	

U = not detected

Figure A-1. Chromium Levels at 116-D-7.

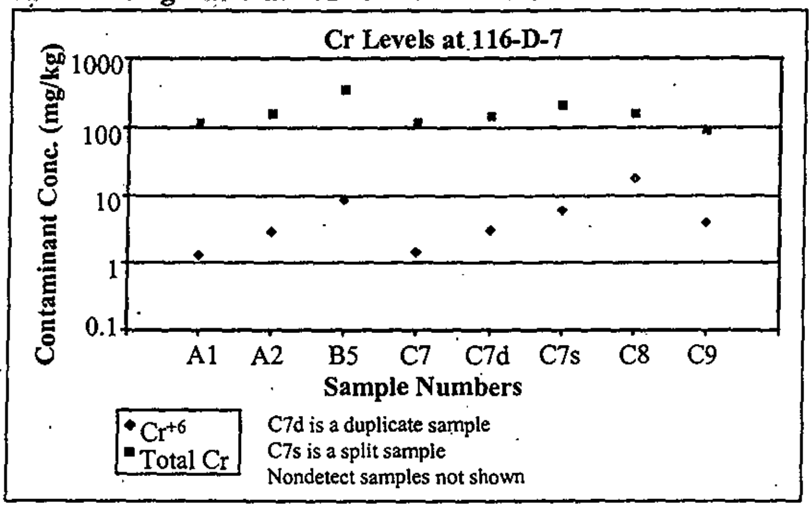
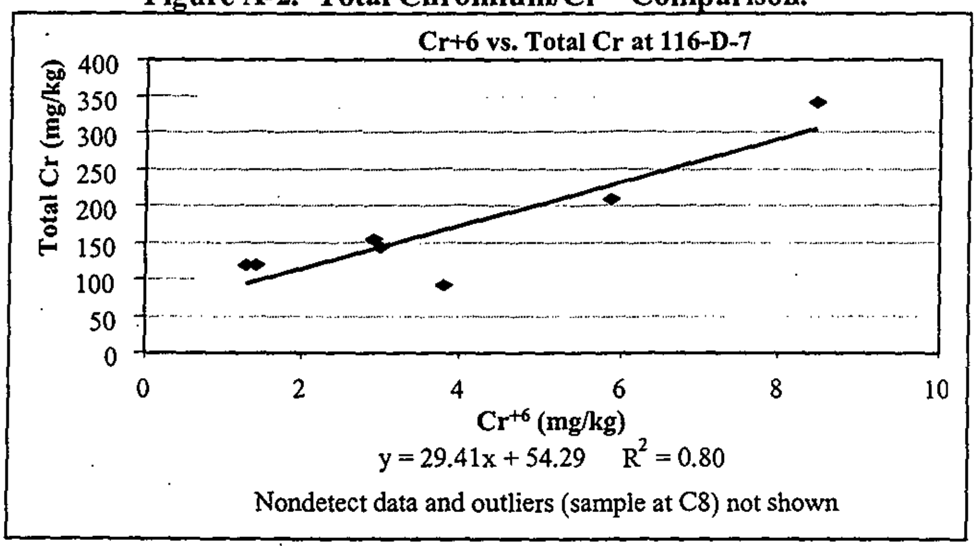


Figure A-2. Total Chromium/Cr^{+6} Comparison.



APPENDIX B

BATCH TEST DATA FORMS

Table B-1. Batch Test Matrix. (3 pages)

Time	pH	Cond.	ORP	T- Cr	Hex Cr
First					
Conc. #1					
A					
B					
C					
Conc. #2					
A					
B					
C					
Conc. #3					
A					
B					
C					
Conc. #4					
A					
B					
C					
Conc. #5					
A					
B					
C					
Time	pH	Cond.	ORP	T- Cr	Hex Cr
Second					
Conc. #1					
A					
B					
C					
Conc. #2					
A					
B					
C					
Conc. #3					
A					
B					
C					
Conc. #4					
A					
B					
C					

Table B-1. Batch Test Matrix. (3 pages)

Time	pH	Cond.	ORP	T- Cr	Hex Cr
Conc. #5					
A					
B					
C					
Time	pH	Cond.	ORP	T- Cr	Hex Cr
Third					
Conc. #1					
A					
B					
C					
Conc. #2					
A					
B					
C					
Conc. #3					
A					
B					
C					
Conc. #4					
A					
B					
C					
Conc. #5					
A					
B					
C					
Time	pH	Cond.	ORP	T- Cr	Hex Cr
Fourth					
Conc. #1					
A					
B					
C					
Conc. #2					
A					
B					
C					
Conc. #3					
A					
B					
C					

Table B-1. Batch Test Matrix. (3 pages)

Time	pH	Cond.	ORP	T- Cr	Hex Cr
Conc. #4					
A					
B					
C					
Conc. #5					
A					
B					
C					
Time	pH	Cond.	ORP	T- Cr	Hex Cr
Fifth					
Conc. #1					
A					
B					
C					
Conc. #2					
A					
B					
C					
Conc. #3					
A					
B					
C					
Conc. #4					
A					
B					
C					
Conc. #5					
A					
B					
C					

Table B-2. Soil Ratio Batch Test Matrix.

Soil Ratio Variation 1:2 (75 g soil + 150 mL conc. #3)					
	pH	Cond	ORP	T- Cr	Hex Cr
Conc. #3					
A					
B					
C					
Soil Ratio Variation 1:8 (25 g soil + 200 mL conc. #3)					
	pH	Cond	ORP	T- Cr	Hex Cr
Conc. #3					
A					
B					
C					

Table B-3. Quality Assurance/Quality Control Samples.

Blank Soil with Deionized Water					
	pH	Cond	ORP	T- Cr	Hex Cr
A					
B					
C					
Container Blanks					
	pH	Cond	ORP	T- Cr	Hex Cr
Conc. #1					
Conc. #2					
Conc. #3					
Conc. #4					
Conc. #5					

100 BC Group 1
116C-1 Liquid Waste Disposal Trench
Vadose Zone Test Pit
Meeting Agenda
December 1, 1997
1B40/3350 GWW

- Scope and Technical Details
- Schedule Details
- Summarize Agreements

EXAMPLE 116-C1
FROM CHARACTERIZATION

116C-1 Liquid Waste Disposal Trench
Vadose Zone Test Pit

Scope and Technical Details

On November 25, 1997 a meeting was held with DOE-RL, EPA, Ecology and BHI, regarding the Remedial Action site closeout process in general, and the 116-C1 Liquid Waste Disposal Trench site close out details specifically. It was discussed that upon evaluation of the 116-C-1 data for purposes of analysis to demonstrate obtainment of groundwater and River Remedial Action Goals (RAGs), there is a general data gap and uncertainty of information in the lower portion of vadose zone, directly above groundwater.

(conservative extrapolations of [illegible] at the bottom of the 116-C1 excavation to the [illegible] of the [illegible])

It was further discussed that based upon best estimates of contaminant profile ~~with depth~~ to groundwater; Ni63, Pb, Hg and total Cr did not meet River and/or groundwater RAGs utilizing a 30" per year, for 1,000 years, irrigation scenario in RESRAD modeling. It was agreed that additional, site specific vadose zone information would be required for site closeout purposes at the 116-C1 Liquid Waste Disposal site (100 BC Area, Group 1 site).

KK

It was further agreed that a test pit exploration method would be acceptable, and a sampling interval of 1 meter would be appropriate, to include sampling and testing for all Contaminants of Concern (COCs), for purposes of the 116-C1 closeout specifically, and provide information to initially assess applicability of the test pit information to other waste sites within the 100 BC Area, and the 100 Area in general.

A summary of technical details of the test pit are as follows:

1. Test Pit estimated total depth in the range of 8 to 10 meters, from the bottom of the existing 116-C1 remedial action excavation, to first encountered groundwater.

   The Subcontractor shall be directed to take all necessary measures to assure safety; and control/mitigate surface run-on, and erosion, as needed.

2. Test Pit/sampling location, at the west end of the trench, near the effluent discharge pipe area, directly below the highest contaminant concentration area as tested at the bottom of the current 116-C-1 excavation exposure. Refer to attached site plans for approximate locations.

   Bench marks will be established at the bottom of the 116-C-1excavation, to readily obtain necessary vertical and horizontal control measures related to the test pit excavation. In addition, a topographic survey and map will be performed for the as-built test pit excavation, to depths that are safely accessible.

3. Excavation/equipment method: John Deere 992D-LC Excavator, 2.5 cubic yard bucket, or equivalent.

4. Composite sampling interval every 1 meter, and as warranted in the field at lithologic changes, via bulk grab sampling taken from the middle of the excavator bucket.

   The composite sampling at each 1 meter depth interval, will consist of a minimum of three samples to form a composite, taken within a maximum 3 by 3 meter square grid, located over the identified highest contaminant concentration from recent MRDS survey (gamma total activity) at the bottom of the 116-C-1 excavation.

   Remaining aliquots of the composite samples will be archived and retained by ERC in 5 gallon, sealed buckets at the 100 BC site, for a maximum period of 6 months.

5. Field screening will be performed as required for Radiological Controls, Health and Safety purposes, and general information for site closeout purposes, and will include, but not be limited to: Geiger-Meuller (GM) for gross beta-gamma, plastic scintillators for both beta/gamma and alpha, and Sodium Iodide (NaI) for gamma total activity.

6. Test Pit observation and logging. The test pit will be logged in the field by ERC qualified staff to observe and record material types and lithologic and facies changes, and record the field screening data.

7. Excavation and Backfilling of the test pit:

   A. Stockpile excavated test pit materials at the bottom of the 116-C-1excavation.

   B. Upon completion of the excavation, place 1 meter of clean soil from identified, native borrow pits to the south of 116-C-1, at the bottom of the test pit.

   C. After placement of the 1 meter of clean soil at the bottom of the test pit excavation, backfill the remainder of the vadose zone excavation in the same sequence in which soils were removed, using the same materials which were removed from the excavation.

   D. The stockpiled soils will continue to be placed within the bottom of the 116-C-1 excavation, to an elevation no higher than the shallow/deep zone interface for the 116-C-1 site. Any remaining stockpiled soils will be placed in transportation containers and taken to ERDF for disposal

   E. All backfill will be placed in maximum 1 meter thick, compacted lifts, utilizing the weight and/or down-pressure of the excavator as the compactive effort.

8. Laboratory testing of samples obtained from the test pit. The "100 Area Remedial Action, Sampling and Analysis Plan", DOE/RL-96-22, Rev 0 (SAP), lists the following initial COCs for the 116C1 waste site: Am241, Co60, Cs137, Eu152, Eu154, Eu155, Ni63, Pu238, Pu239/240, Sr90, U238, Total Cr, Cr+6, Hg and Pb. In addition, based upon site specific information obtained during remediation, and preliminary closeout analyses, Ni63, Cd and Zn are potential COCs with respect to obtaining groundwater and River RAGs. KKH

[illegible] will be requested

   This above full series of COCs, including Ni63, Cd and Zn, will be sampled for at each composite sampling interval, and laboratory tested performed utilizing protocols and methods for Quick Turnaround Laboratory testing outlined in the SAP. , Report all ICP metals, for purposes of further evaluation at other waste sites, if needed.

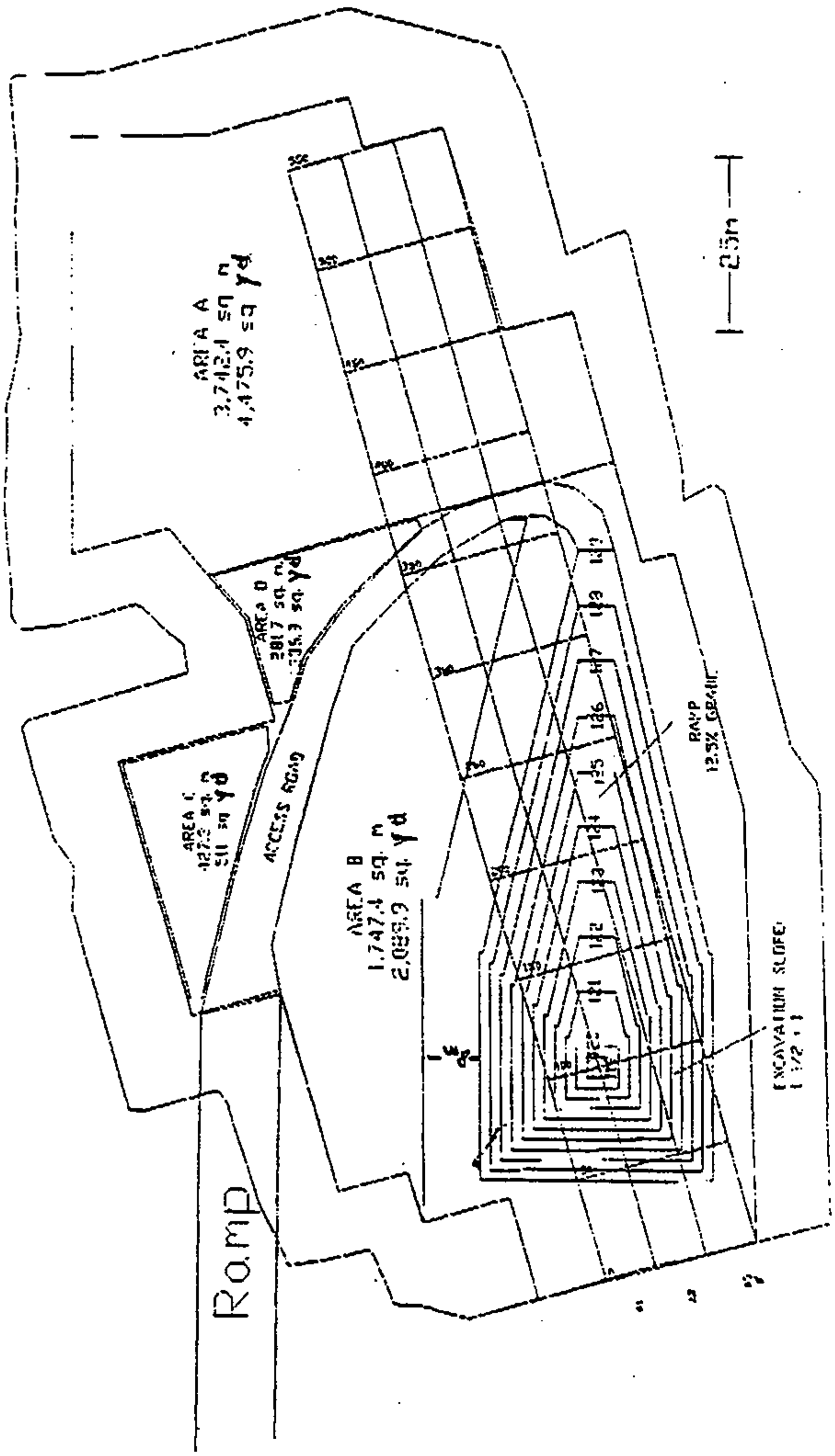
9. The Test Pit and Laboratory testing results will be utilized to update and revise the vadose zone site specific model, and RESRAD numerical modeling analyses performed to make a final assessment of obtainment of groundwater and River RAGs, under the 1,000 year, 30"/year irrigation scenario.

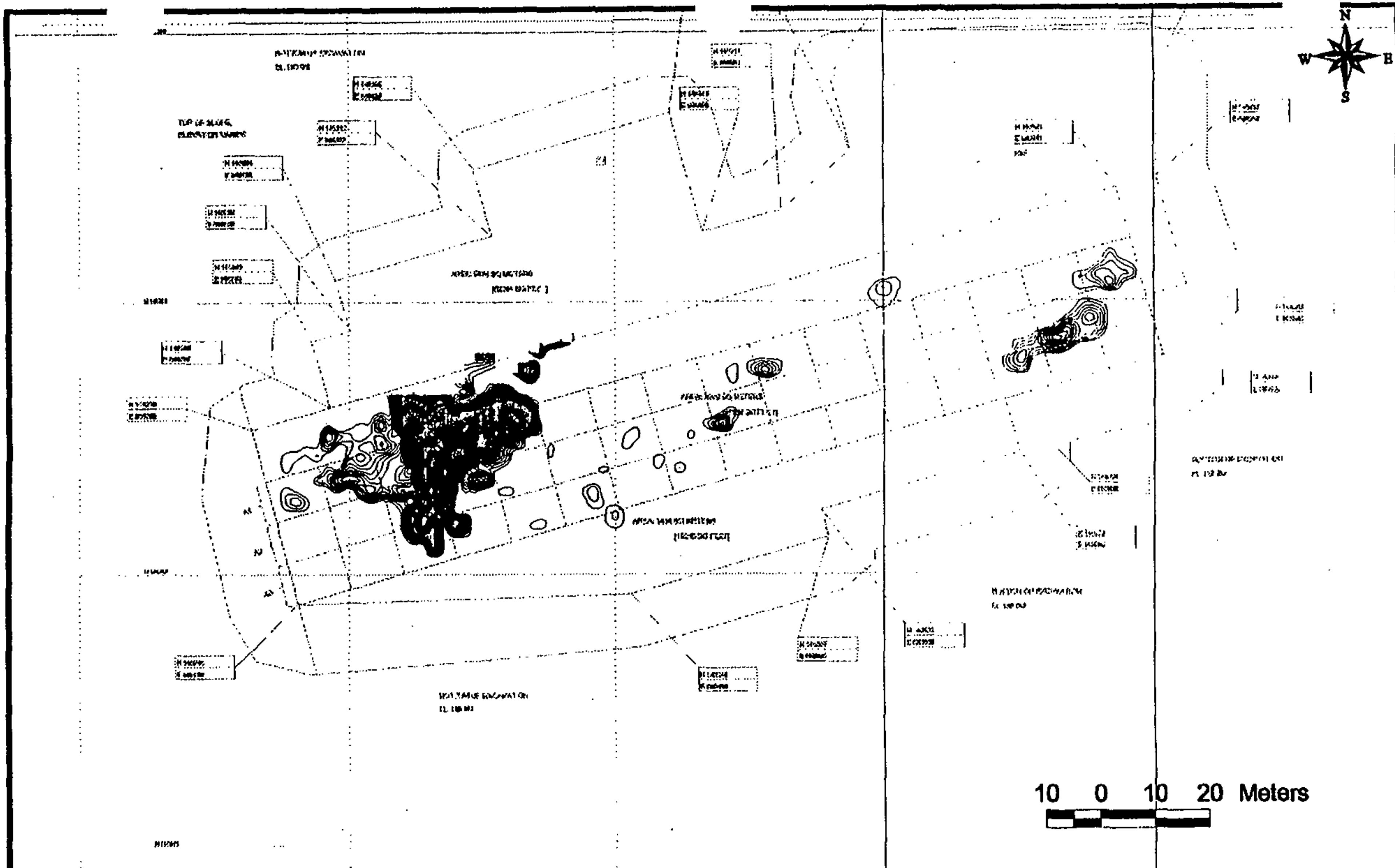
Schedule Details

The proposed schedule for test pit completion, subsequent laboratory testing and RESRAD numerical analyses is attached. The attached schedule assumes that River and groundwater RAGs are met based upon the site specific data. In the event that the site specific data indicates River and groundwater RAGs are not met under a 30-inch per year irrigation scenario, for 1,000 years, the regulatory pathway will have to be evaluated and agreed upon immediately, and the schedule logic and durations for site closeout revised.

Concurrence

[signature]	12-1-97
D.A. Faulk, EPA	Date
Keith K. Holliday	12-1-97
K.K. Holliday, Ecology	Date
for Owen Robertson / [signature]	12-1-97
N.A. Werdel, DOE-RL	Date
[signature]	12/1/97
R.L. Donahoe, BHI Task Management	Date


AREA A
3,742.4 sq m
4,475.9 sq yd
AREA B
1,747.4 sq m
2,089.9 sq yd
ACCESS ROAD
RAMP
12.5% GRADE
EXCAVATION SLOPE
25m
Ramp



GM uR\Hr

- < 100
- 100 - 250
- 250 - 500
- 500 - 1000
- > 1000

Summary Statistics

Survey File: C11117, C118, C118A, C118B
Date of Survey: 11/17/97 & 11/18/97
Survey Background: 15.9
# of Data Pnts: 8656
Max uR\Hr Survey: 2012.7
Project File: C1_NOV
Layout: Dose_Con

100 BC Remedial Action
MRDS Radiological Surveys
116-C-1
GM Dose Contour

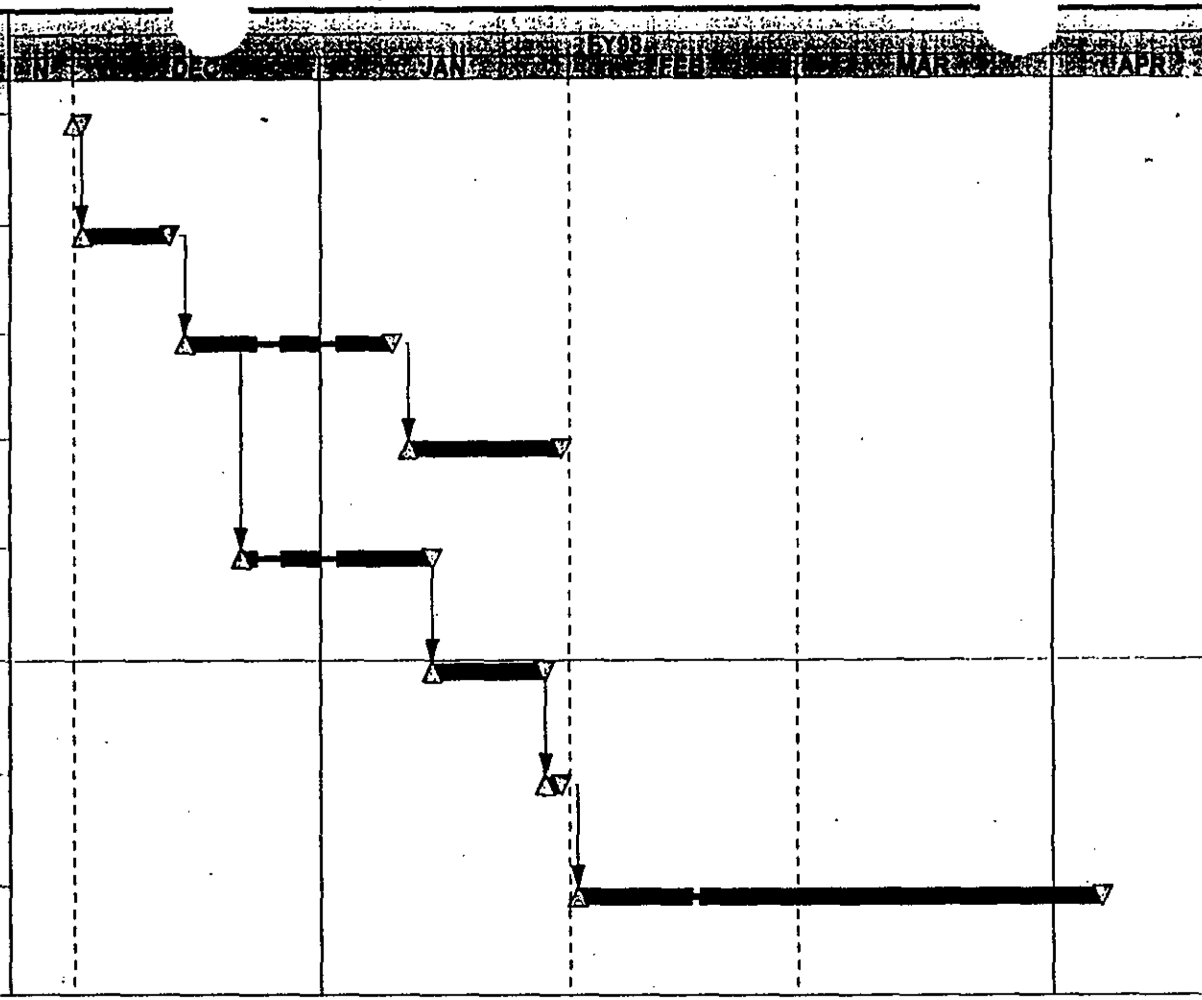
Prepared By:

Reviewed By:

MRDS
Mobile Radiological Data System
ThermoHanford Inc.

Attachment 8

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Test pit - Excavation				
RBCK-2200	Meet with Regulators/Finalize details	1	01DEC97*	01DEC97
RBCK-2210	Mobalize and arrange funding	9	02DEC97	12DEC97
RBCK-2230	Excavate Test pit	15	15DEC97*	09JAN98
RBCK-2235	Backfill	15	12JAN98*	30JAN98
RBCK-2240	Offsite Lab Analysis	13	22DEC97*	14JAN98
RBCK-2250	Run RESRAD	10	15JAN98*	28JAN98
RBCK-2260	Present Results	2	29JAN98	30JAN98
RBCK-2270	Proceed with verification package	45	02FEB98	06APR98



Attachment 8

Project Start	01OCT97	Early Bar	TPIT
Project Finish	19MAY98	Progress Bar	100 BC Test Pit
Data Date	01OCT97	Critical Activity	Excavate
Run Date	26NOV97		Sheet 1 of 1

U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

0539260

DEC 9 1997

Mr. Steve M. Alexander
Perimeter Areas Section Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 W. Fourth Avenue
Kennewick, Washington 99336-6018

Mr. Douglas R. Sherwood
Hanford Project Manager
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352-0539

Dear Messrs. Alexander and Sherwood:

WASTE STREAM CONSIDERATIONS AND WASTE DESIGNATION BY REPRESENTATIVE SAMPLING, 100-DR-1 REMEDIAL ACTION PROJECT

At the 100-DR-1 Remedial Action Site, excavations in the 116-DR-9 and 116-D-7 concrete-lined basins encountered construction elements within the matrix of radioactively contaminated demolition debris that have high lead (Pb) concentrations in excess of Environmental Restoration Disposal Facility (ERDF) acceptance limits. Three other similar basins exist elsewhere within the 100 Areas.

The U.S. Department of Energy, Richland Operations Office, proposed an alternative designation method to the U.S. Environmental Protection Agency (EPA) and the State of Washington Department of Ecology (Ecology) in a meeting held on June 25, 1997. EPA and Ecology agreed that due to the impracticability of separating the individual construction elements, waste designation by representative sampling of the entire waste stream meets the intent of the regulations. Using this designation method, the waste stream resulting from the remediation of the basins is well below the ERDF acceptance limits. General discussions of the designation approach are outlined in the June 25, 1997, meeting minutes and details of the representative sampling method are outlined in the July 24, 1997, meeting minutes with Ecology.

Total cost avoidance for worker protection, separation, and treatment of the waste is approximately $2,069,000 for all the basins. Radiation protection for several months of manual labor would also be required to separate the material.

The Waste Profiles, Rev. 2 for the 116-D-7 waste site (WP-116D7001) and Rev. 3 of the 116-DR-9 waste site (WP-116DR9001), have been completed. These profiles address the "waste designation by representative sampling" of the basins. The profiles support disposal of the 100-DR-1 waste stream in ERDF, which began the end of fiscal year 1997 and will extend well into fiscal year 1998. No special handling/packaging of the above waste stream will be implemented at 100-DR-1, other than normal remote handling via excavator bucket, dust suppression during demolition and placement in lined/tarped container for shipment to ERDF. Similar best-management practices will also be used for handling and final placement in ERDF. As deemed necessary, awareness training will be provided to the ERDF transportation workers, workers at ERDF, and associated Environmental Restoration Contractor staff, and/or addressed and documented at plan-of-the-day meetings. This approach will also be used for the analogous waste sites at other remedial action projects, and will be considered on a case-by-case basis for other facilities.

If you want to discuss this matter further or require additional information, please contact me at 376-9552.

Sincerely,

Glenn I. Goldberg, Project Manager
Remedial Actions Project

RAP:GIG

cc: F. M. Corpuz, BHI
R. L. Donahoe, BHI
D. A. Faulk, EPA
L. E. Gadbois, EPA
K. K. Holliday, Ecology
P. S. Innis, EPA
W. W. Soper, Ecology

LEAD MATRIX DISPOSAL APPROVAL

Attachment 9

050456

Job No. 22192
Written Response Required? NO
Closes CCN N/A
OU N/A
TSD N/A
ERA N/A
Subject Code 4170, 6400;7120

Environmental Restoration Contractor **ERC Team**

Meeting Minutes

SUBJECT Waste Disposal

TO Distribution

FROM FV Roeck FVR

DATE July 7, 1997

ATTENDEES

Frank Corpuz (BHI) X9-06
Nancy Crosby (DOE) B5-13
Jerry White (BHI) H0-05
Jim Rugg (BHI) X5-53
Glenn Goldberg (DOE), H0-12
Tom Post (EPA) B5-01
Phil Staats (Ecology) B5-18
Dennis Faulk (EPA) B5-01
Mike Mihalic (BHI) X5-53
Owen Robertson (DOE) H0-12
Fred Roeck (BHI) H0-17
David Olson (DOE) H0-12
Jeff Bruggeman (DOE) H0-12
Greg Borden (BHI) X1-86
Roger Landon (BHI) H0-18
Jean Dunkirk (BHI) H0-13
Keith Holliday (Ecology) B5-18
Jack Donnelly (Ecology) B5-18
Bob McLeod (DOE) H0-12
Pam Innis (EPA) B5-01
Barry Vedder (BHI) H0-18
Dave Einan (EPA) B5-01
Dean Ingemansen (EPA) (by telephone) B5-01
David Bartus (EPA) B5-01
Laura Cusack (Ecology) B5-18

DISTRIBUTION

Attendees
V. R. Dronen H0-17
W. L. Pamplin H0-18
A. R. Michael H0-17
W. E. Remsen H0-17
J. R. James H0-17
BHI DIS H0-17

The subject meeting was held on Wednesday, June 25, 1997, 7:00-10:30 a.m., at Bechtel Headquarters, 3350 George Washington Way, conference room 1B40.

The meeting facilitator was Nancy Crosby, of the Department of Energy, Richland Office.

The meeting began with attendee introductions and a brief overview of meeting agenda, both led by Nancy Crosby. Pam Innis of the Environmental Protection Agency (EPA) led discussion on the general overview of issues and stated the meeting's goal was to discuss and make decisions on key waste issues for the remediation sites. After a review of the agenda (Attachment), the attendees concluded the topics may flow better if discussed in reverse order. This change was made to the order of discussion topics. The following is a summary of the discussion topics and will represent to only documentation of the decisions made.

<u>Debris Matrices</u> **Objective: Develop a definition of a matrix and set reasonable criteria for when treatment is necessary.**

An introduction to the topic of waste handling as debris matrix was presented. Specifics of the 100-D Area retention basin remediation were discussed and historical and recent photos shown. The photographs illustrated the diverse nature of the materials present in the demolition debris including coatings on concrete surfaces, copper within the concrete and at construction joints, reinforcing steel (rebar), etc. It was noted that some imbedded material and surface coatings contain leachable lead concentrations in excess of ERDF waste acceptance criteria limits. No lead is known to have leached from the structure into the soil or groundwater

The regulatory basis for handling these materials as matrix debris requiring no further separation or treatment was discussed. In the proposed rule for contaminated debris (57 FR 958, 1/9/92), the EPA affirmed that if a representative sample of a demolition debris matrix did not exhibit the toxicity characteristic using the TCLP, and assuming that there are no listed wastes present, the debris would not be considered hazardous. Also, if anomalous material is not easily removable by mechanical means, it is not defined as a separate or distinct waste stream. Since the subject remediation debris materials is embedded and inseparable it meets the definition of a matrix and is within the regulatory guidelines of EPA.

A preliminary cost estimate for separation and treatment by encapsulation (including the added costs associated with worker protection) indicate an increased remediation cost of $0.5 million per retention basin. A total of five such basins exist in the 100 Area. Moreover, physical separation would require workers to come in contact with contaminated materials resulting in radiation exposure that would likely require multiple crews for continued remediation to avoid exceeding administrative exposure limits of 500 mRem/yr.

EPA commented that the anomalous materials is a waste designation rather than a debris matrix issue and felt that the matrix concept should not necessarily be the focus of the discussion. EPA contended that it is the generator's responsibility to define a representative sample of a waste stream for designation purposes and to use reasonable separability as a criteria when applied to clearly different waste streams, thus avoiding the matrix issue.

Decision Summary: Key Elements

- Waste designations are made waste stream by waste stream, based on representative characterization of each waste stream, and are the responsibility of the generator. Easily separable anomalous material should be considered a separate waste stream . Otherwise, it is expected that a liquid waste site is a single waste stream and can be designated by a single waste profile. It was recognized that such waste streams would continue to be evaluated on a case-by-case basis.

- Where ERDF Waste Acceptance Criteria are consistent with LDR treatment requirements, then waste generated from remedial action waste sites requires no special handling or treatment provided representative sampling of the waste stream, including any inseparable debris, indicates compliance with regulatory waste disposal limits.

- DOE will proceed with remediation and disposal of the inseparable materials (e.g., copper water stops and concrete surface coatings) for the 116-DR-9, 116-D-7, and similar retention basins based on representative samples and the waste designation process.

- Administratively, designation of waste streams by representative sampling is handled at the operable unit level with concurrence/guidance (but not approval) from the appropriate Regulatory Agency. The waste designation rationale will be included as part of the documentation accompanying the Waste Profile for the individual sites.

Action: Frank Corpuz, Keith Holliday, Glenn Goldberg and Greg Borden
Determine ERC's representative sample strategy for designation.

<u>Anomalous Wastes</u> **Objective: Define anomalous waste and clarify the level of effort contractors should put forth in identifying these wastes.**

Test pit information from the 300 Area 618-4 burial ground was presented. Waste encountered in two test pits excavated during preliminary investigations included a diverse mix of debris and soil. Based on the anomalous waste encountered in these test pits, the remediation team has two potentially conflicting remediation goals; 1) excavate in a timely, cost effective manner, and; 2) do so in compliance with applicable regulations.

Due to the potentially high volume of anomalous material present in the burial grounds, the remediation project team plans to train the field crew in anomalous waste identification. In this way, materials of concern can be readily identified and removed at any step of the remediation process. The remediation team is in the process of compiling a lists of known materials that can and cannot proceed to disposal without treatment or further sampling and analysis if encountered in the field. This information would be used by the field crew for guidance as excavation proceeds. However, field crews may not be able to rely on visual identification alone to segregate anomalous materials. A draft logic chart was presented that is to be used as an operator's aid to identify the appropriate actions to take when different type of materials are encountered in the field. Concern was expressed that, if a great deal of material is found requiring further investigation, these materials could exceed onsite storage capacity and cause work delays while disposal decisions are being made.

EPA indicated that the intent of the debris rule regulations is to avoid excessive sampling and emphasized the need to minimize sampling of anomalous waste by segregating materials of concern into general types and applying one treatment technology to each type. It was suggested that the draft materials lists for the field crew could thus fall into three categories: 1) material obviously qualified for immediate disposal, 2) material obviously not qualified for immediate disposal, and 3) items that need additional analysis for a disposal determination. It was further added that contingency plans for equipment (e.g., a "grizzly") and procedure inadequacies would be prudent.

EPA initiated a discussion concerning whether certain waste resulting from remediation, such as drummed metal shavings encountered in the 618-4 burial ground, should be considered a remediation waste or as-generated process waste. The local EPA representatives have considered such waste as remediation waste and believe it had been documented in the ERDF ESD. It was stated that such waste streams should be addressed on a case-by-case basis by the appropriate project managers, particularly in dealing with decommissioning of facilities.

Actions: Bob McLeod and 618 Burial Ground team
Continue working on lists of anomalous waste for use at the burial ground.

Fred Roeck, Pam Innis
Check the ERDF ESD for the language concerning process waste and clarify the meaning in the ERDF ROD Amendment, if necessary.

<u>Land Disposal Restrictions</u> **Objective: To define the level of sampling necessary to adequately characterize a waste site.**

The LDR subject was introduced in order to better define what constitutes a reasonable sampling, analysis, and waste designation strategy when using the observational approach during remediation. It was explained that for soil remediation sites, sampling data are often returned after the soil has been disposed. It was stressed that the initial soil waste stream characterization for the site may remain valid when an individual sample falls outside of the profile. An evaluation of the validity of the profile should be done to confirm this.

General agreement was reached that a single sample result would not invalidate an otherwise appropriate waste designation but that it should be evaluated to determine whether a waste stream may be outside the limits of the site's profile and therefore of potential concern. EPA indicated the expectations that some action (e.g., update the waste profile) may be needed if after-the-fact sampling results indicated results above concentration levels normally anticipated, but that this judgement would be left to the waste originator. ERC personnel are writing a procedure(s) to address such sample data management.

It was discussed how materials with comparable treatment standards (e.g., lead) originating from different waste sites could be grouped together and addressed under one LDR treatment plan. This idea received favorable comments from attendees and EPA asked that DOE treatment plan submittals be written in a broad fashion. It was indicated that for 100-B/C and 100-D remedial actions, the current volume of lead material to be treated is relatively small and that the preferred treatment is concrete encapsulation. This proposal was previously discussed and concurred with by EPA and Ecology representatives Pam Innis and Keith Holliday, respectively. DOE intends to issue a treatment plan to EPA and Ecology.

Decision Summary:

- For remedial action waste streams, evaluation of potential LDR conditions is based on representative designations of the waste stream. Evaluation of the continuing validity of the designation by considering the average results of ongoing is within the authority and responsibility of the waste originator. In instances where there may be a bimodal distribution, some components of a waste stream subject to land disposal restriction treatment standards might fail to meet numerical treatment standards.

- If sampling results in a data point that exceeds the waste site profile , then the profile would be re-evaluated. In this way, it may be determined that one or a few data points exceeding the Profile do not invalidate the overall waste stream designation.

- For the anomalous LDR materials set aside for treatment at the 100-B/C and 100-D Areas (i.e. lead), the planned treatment technology is concrete encapsulation. A treatment plan will be submitted for regulator review.

Action: Frank Corpuz
Submit a treatment plan to EPA/Ecology within one month

After a short open discussion of waste disposal issues, attendees offered general consensus on the decisions and actions reached at the meeting. The meeting adjourned at 10:30 a.m.

Concurrence:

Owen Robertson 8/21/97
Owen Robertson - DOE-RL Date

Pamela S. Innis 8/21/97
Pam Innis - EPA Date

8/22/97
Jack Donnelly - Ecology Date

Waste Disposal Meeting Agenda
3350 George Washington Way, Room 1B40
June 25, 1997 7:00 - 12:00

Facilitator: Nancy Crosby, U.S. DOE

7:00 Introductions

7:30 General Overview of Issues
- LDR
- Debris Matrices
- Anomalous Waste
- Other

7:45 Land Disposal Restrictions
Objective: To define the level of sampling necessary to adequately characterize a waste site
- Problems encountered
- Brief review of 100-D lead disposal incident
- Discussion

9:00 Anomalous Wastes
Objective: Define anomalous waste and clarify the level of effort contractors should put forth in identifying these wastes
- Burial Grounds Examples
- Discussion

10:00 Debris Matrices
Objective: Develop a definition of a matrix and set reasonable criteria for when treatment is necessary
- Definition of debris
- Overview of 100-D Basin Debris
- Discussion

11:00 Open Discussion

11:30 Decision Summary

DETAIL WASTE (LEAD) MATRIX DETERMINATION

Attachment 9

051115

Job No. 22192

Written Response Required: NO
Closes CCN: N/A
OU: 100 DR
TSD: N/A
ERA: N/A
Subject Code: 4170; 4170

Environmental Restoration Contractor **ERC Team**

Meeting Minutes

SUBJECT REPRESENTATIVE SAMPLING FOR WASTE DESIGNATION

TO Distribution

FROM F. M. Corpuz FMCorpuz

DATE July 30, 1997

ATTENDEES	
G. J. Borden	X1-86
F. M. Corpuz	X9-06
P. G. Doctor	H0-02
G. I. Goldberg	H0-12
K. K. Holliday	B5-18
J. D. Ludowise	H9-01
F. V. Roeck	H0-17
J. W. Yokel	B5-18

DISTRIBUTION	
Attendees, w/a	
R. L. Donahoe	X9-06
A. R. Michael	H0-17
M. A. Casbon	T2-05
Document and Info Services	H0-09

A meeting on the above subject was held on July 24, 1997, at 100 D Area, RCIE Conference Trailer.

The meeting was opened by reviewing the previous discussions with EPA and Ecology that had highlighted the issue of defining and properly sampling the waste stream from five 100 Area retention basins. Minutes from a June 25, 1997 meeting on the subject of statistically designating an entire waste stream was statused as out for concurrent review.

Discussion of a proposed representative sampling strategy for proper statistical waste stream designation was the stated purpose of the meeting .

The proposed representative sampling approach for designating the waste from 100 Area retention basin sites was reviewed. The approach, using approved SW846 stratified sampling methodology, would provide a representative sample of the basin waste sites containing different commingled materials, e.g. concrete with integral copper sheeting, construction felt, joint calking, and rubber gasket material. Because these materials are so heterogeneously distributed and different in nature, it would not be practical to obtain a representative sample(s) (or physically composite samples) for toxicity characteristic leaching procedure (TCLP) analysis. Therefore, a more cost effective sampling approach was proposed to deal with all of the waste site materials as a numerical composite for waste designation purposes.

The representative sampling approach was described using a one page handout (attachment). Individual steps used in the stratified sampling technique, including sampling different strata separately and using a statistical method to attain the overall TCLP concentration, was discussed by the attendees. The steps used to determine the upper confidence limit (UCL) of 90% (one-tailed confidence interval) were reviewed and technical questions about the handout answered.

A summary of the data from sample locations in waste sites 116-DR-9 and 116-D-7 was reviewed. It was pointed out that the TCLP result for these sites is within the acceptable regulatory disposal limits for lead, using a UCL greater than 80% (per SW846 guidance). The variance in copper levels, especially the large variance between samples from the 116-DR-9 site was discussed. No sample data were eliminated from the calculation as being anomalous.

At Ecology's request, the calculations used to arrive at the samples' weighted mean result were reviewed. The attendees agreed that they understood the explanation of the calculation method.

It was noted that some analytical results from specific portions of the waste stream exceed the Environmental Restoration Disposal Facility (ERDF) "non-LDR" acceptance limits for total lead. A limit of 5000 mg/kg is established as a worker protection limit for inhalation of lead. The limit does not apply to the subject waste stream because the lead is not in a respirable form.

The process by which the waste profiles for each site will be modified, using this stratified sampling data, was discussed. It was conveyed that the sample calculations will be incorporated and revise both the waste designation and the waste profiles. The profile revisions will reflect the highest total contaminant value and the highest land disposal restriction (LDR) contaminant value for individual constituents. Since the highest total value exceeds the ERDF non-LDR acceptance limit of 5,000 mg/kg, the profile will indicate the lead is in a non-respirable form. For individual lead value(s) that exceeds the LDR criteria, the profile will be based on the statistical calculation to attain the waste stream's overall TCLP concentration. Incorporation of the overall TCLP concentration justification will include a discussion of how the individual samples were taken and how the results were calculated. Representatives of the ERDF facility must review and concur the waste designation and profile revisions prior to the shipment of the waste.

Waste site photos showing the difference materials being encountered were examined. It was noted that as-built drawings provide a refined understanding of the function and placement of the materials being found in the waste sites. No unanticipated situations have been found in correlating the as-built drawings with the materials being encountered at the waste sites.

The meeting attendees adjourned for a tour of the 100 DR Remedial Action Site.

Following a walkdown of the waste sites, the meeting reconvened in the conference room for a wrap-up. It was stated that the site tour enabled a better understanding of the condition and nature of the waste stream and segregation problem.

Ecology representatives requested time to review the information but were in general agreement with the sampling strategy and designation approach based on their observation of site conditions.

(Post-meeting note: Ecology requested additional information and a response was provided, per attached July 30, 1997 electronic mail correspondence).

REPRESENTATIVE SAMPLING APPROACH FOR WASTE DESIGNATION
SW 846 STRATIFIED SAMPLING APPROACH
7/24/97

- Basins contain different materials

  Concrete
  Copper sheeting
  Construction felt
  Rubber gaskets
  Gunite /shotcrete

- Materials differ in leachable lead content

- Cost effective to deal with all materials as composite for waste designation

- Not practical to obtain composite sample for TCLP analysis

- Stratified sampling approach:

  SW 846 - Chapter 9

  More efficient than simple random sampling

  Sample materials (strata) separately - TCLP analysis

  Statistical method to get representative TCLP concentration for comparison to regulatory limits

    Weight TCLP strata averages by volume of material in strata

    Weighted mean: Xbar $= \Sigma W_i X_i$

    Weighted var: $s^2 = \Sigma W_i s^2_i$

    Standard error of mean: $s_{Xbar} = s/\sqrt{n}$

    Confidence interval: Xbar +/- $t_{.20}\ s_{Xbar}$

7-24-97

116-DR-9

Sampling Summary

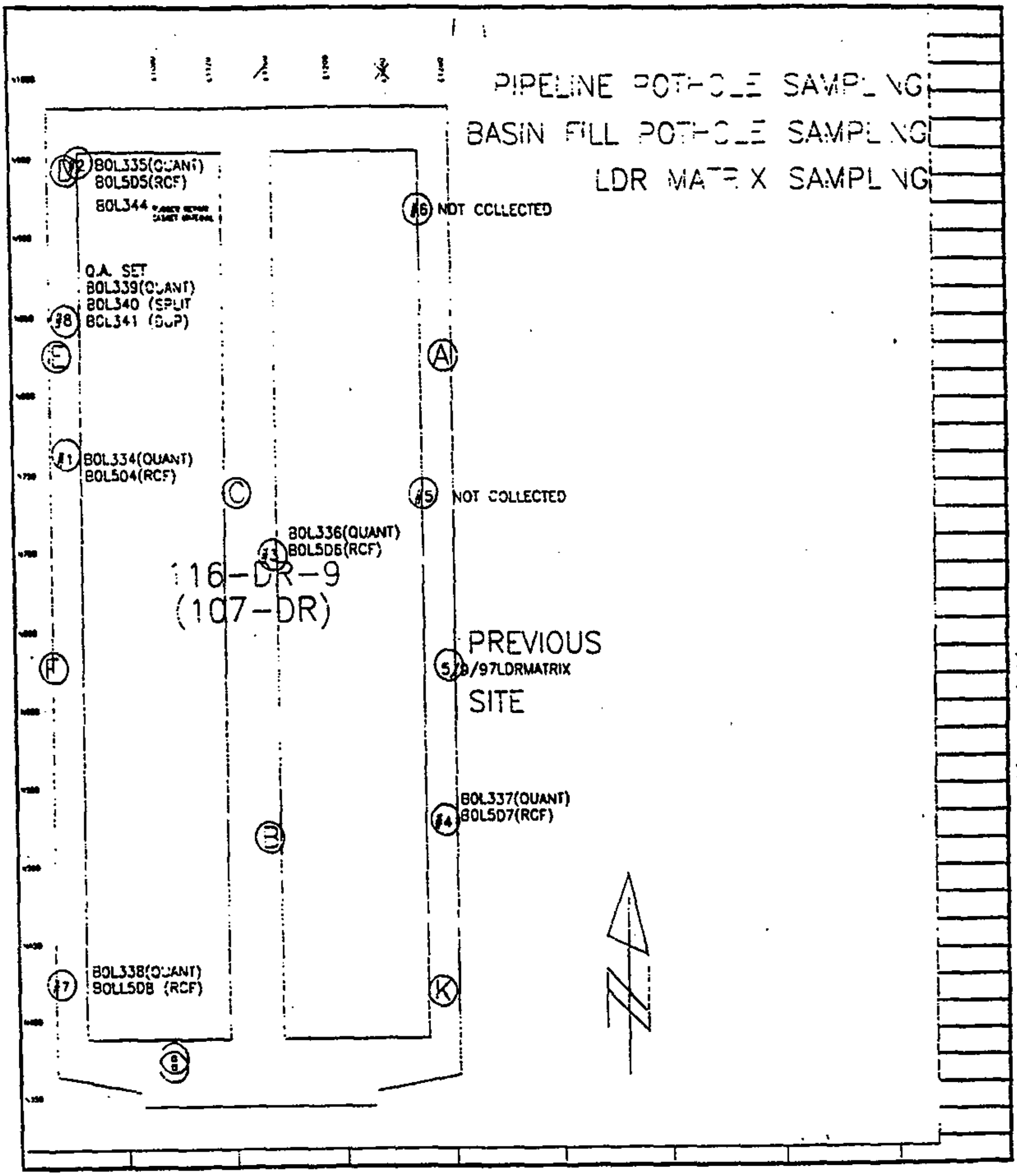
Material Description	*Mean TCLP Result for Lead, mg/L*	*Number of Samples*	*Weight of Material, Tons*	*Fraction of Total Weight*	*Weighted Mean of TCLP Result, mg/L*
Black Coating	0.34	2	10	0.0009	0.0003
concrete rubble	0.78	7	11,000	0.9897	0.7716
copper (0.5mm)	5.38	7	20	0.0018	0.0095
copper (1.0mm)	1.29	7	0.23	0.0000	0.0000
Misc. Copper	301.60	2	0.23	0.0000	0.0063
felt / joint felt	9.56	8	62	0.0056	0.0536
rubber gasket	82.83	11	22	0.0020	0.1647
Sum		44	11,115	1	1.006
Upper Limit of Confidence Interval, 90% Confidence, mg/L					1.90

116-D-7

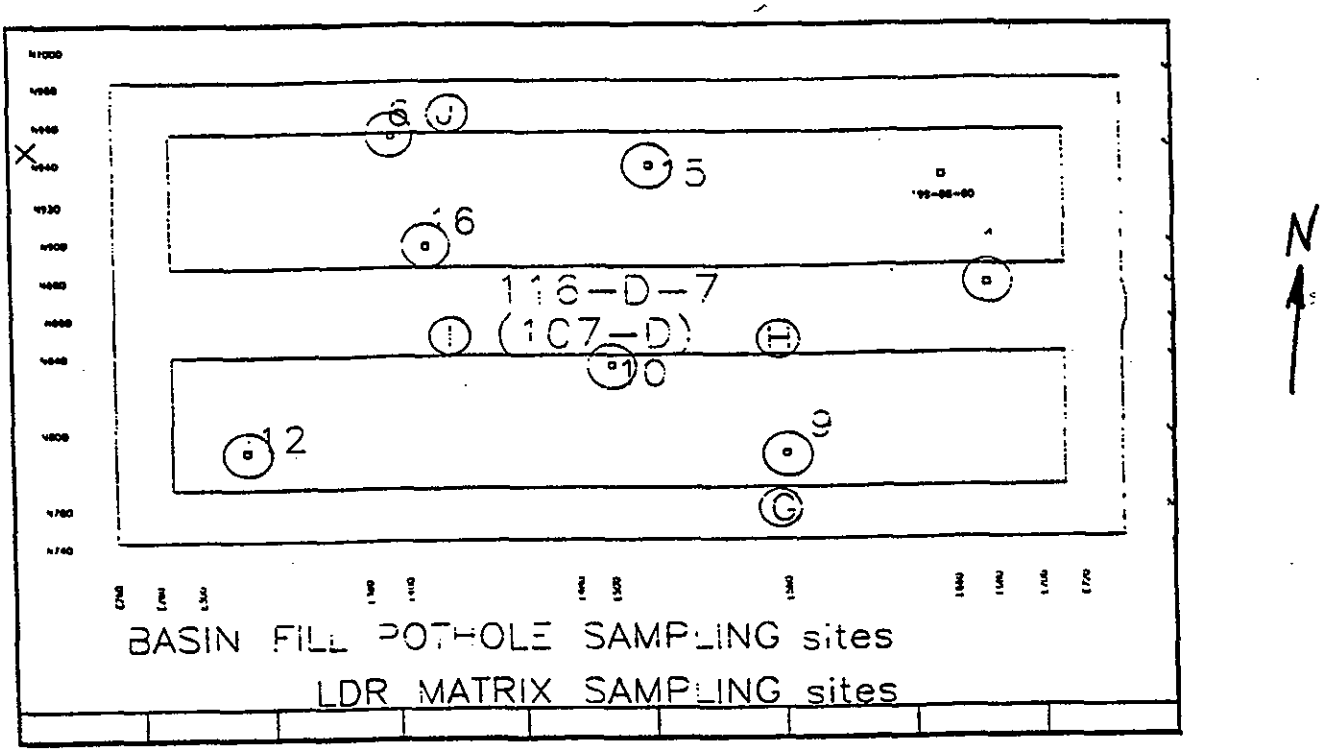
Sampling Summary

Material Description	*Mean TCLP Result for Lead, mg/L*	*Number of Samples*	*Weight of Material, Tons*	*Fraction of Total Weight*	*Weighted Mean of TCLP Result, mg/L*
copper (0.75mm)	6.83	5	0.46	0.0001	0.0005
Black coating	39.71	3	2.43	0.0003	0.0138
Gunite /shotcrete	1.23	7	6,957	0.9992	1.2311
joint cork	110.29	4	0.41	0.0001	0.0065
Joint rubber	158.47	3	2.43	0.0003	0.0553
Sum		22	6,963	1	1.307
Upper Limit of Confidence Interval, 90% Confidence, mg/L					2.53

Sheet9


PIPELINE POTHOLE SAMPLING
BASIN FILL POTHOLE SAMPLING
LDR MATRIX SAMPLING
B0L335(QUANT)
B0L505(RCF)
B0L344
NOT COLLECTED
Q.A. SET
B0L339(QUANT)
B0L340 (SPLIT
B0L341 (DUP)
B0L334(QUANT)
B0L504(RCF)
NOT COLLECTED
B0L336(QUANT)
B0L506(RCF)
116-DR-9
(107-DR)
PREVIOUS
5/9/97LDRMATRIX
SITE
B0L337(QUANT)
B0L507(RCF)
B0L338(QUANT)
B0LL508 (RCF)

Map



116-D-7
(107-D)
BASIN FILL POTHOLE SAMPLING sites
LDR MATRIX SAMPLING sites
N

Subject: Representative for Waste Designation - 116DR9 and 116D7
Author: Franklin M Corpuz at ~BHI007 Date: 7/30/97 1:11 PM

JERRY -

THANKS FOR YOUR COMMENTS BELOW ON SUBJECT. SEE MARKUP BELOW FOR OUR RESPONSES (BOLD CAPS). OUR NEXT AND FINAL STEP IS TO FINALIZE REVISIONS TO THE WASTE PROFILES FOR THESE SITES, INDICATING THAT BASED UPON THE REPRESENTATIVE SAMPLING OF THE WASTE MATRIX, LDR LIMITS FOR LEAD ARE NOT EXCEEDED.

ANY FURTHER QUESTIONS OR COMMENTS, PLEASE CALL. DRAFT MINUTES FROM OUR JULY 24 MEETING ON SUBJECT WILL BE ISSUED SHORTLY FOR YOUR COMMENTS.

REGARDS,
FRANK CORPUZ
373-1661/531-0625

__________ Reply Separator __________
Subject: SW 846 sampling approach
Author: Jerry W Yokel at ~HANFORD02A Date: 7/28/97 11:23 AM

Frank,

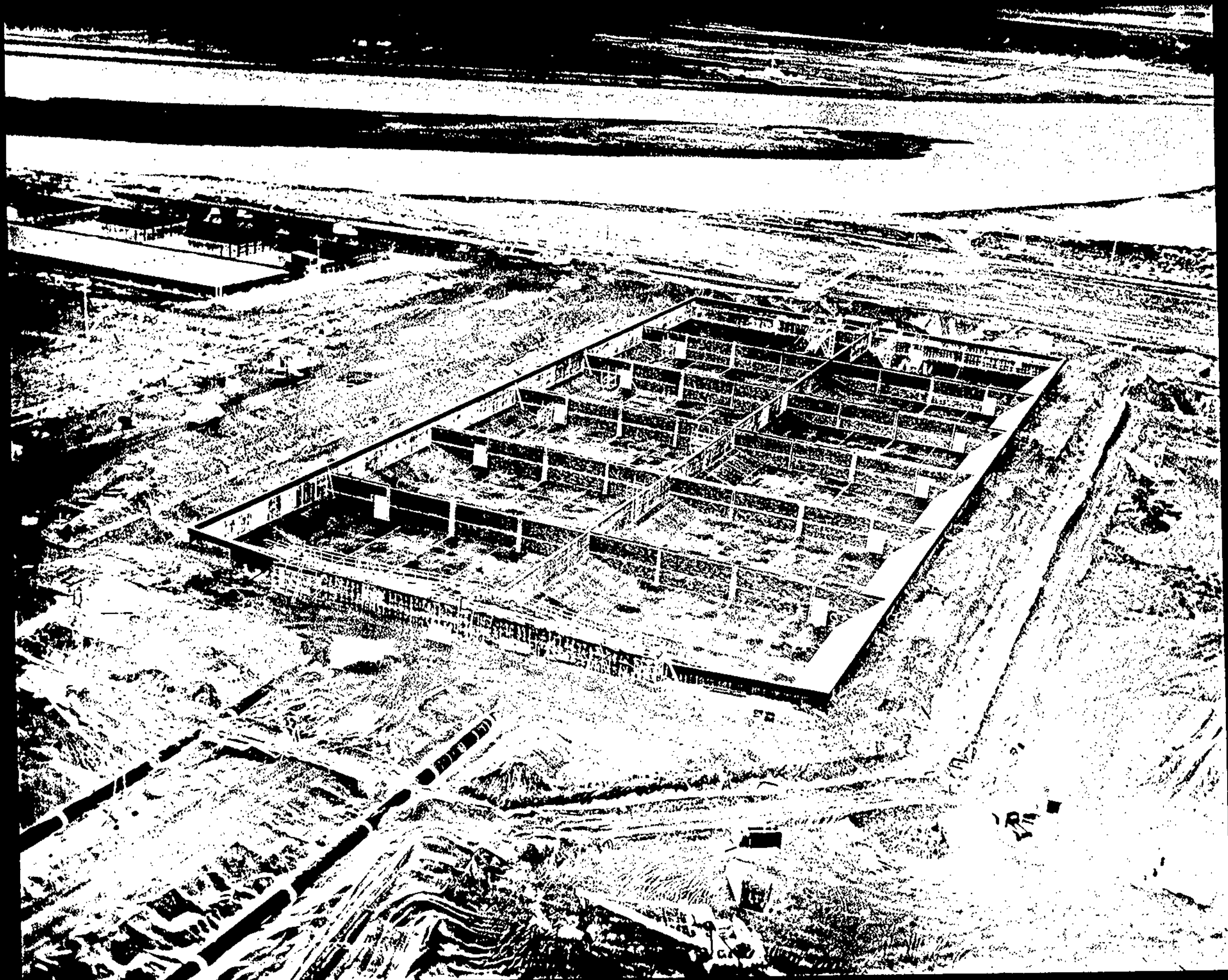
I looked over the data and checked some calculations. All looked fine. My only comment is that the samples were not optimally allocated as described in SW-846. The procedure is based on proportional allocation by volume or weight. The concrete should have been sampled more in proportion to its weight. YES, HOWEVER THE NON-PROPORTIONAL SAMPLING OF THE CONCRETE WAS CONSERVATIVE WITH RESPECT TO THE FINAL ANSWER. FURTHER, THE CONCRETE HAD A VERY SMALL VARIANCE ON TEST RESULTS INDICATING THAT FURTHER TESTING WOULD NOT LIKELY CHANGE RESULTS DRASTICALLY FROM A PRACTICAL PERSPECTIVE.You did sample the copper where you knew the lead was.

Also were any other analytes run on the TCLP list? How do you know that the other contaminants are not present in the waste...caulking, rubber, etc.? Just thinking of what RCRA folks might want to know. THE DECISION TO SAMPLE FOR LEAD ONLY WAS BASED ON PROCESS KNOWLEDGE (BOTH HISTORICAL AND RECENT/INITIAL SAMPLING OF CONSTRUCTION DEBRIS MATERIALS). ONLY LEAD SHOWED UP AT LEVELS OF CONCERN (LDR LIMIT) WHEN THE MATERIALS PREVIOUSLY ENCOUNTERED WERE SUBJECTED TO THE TCLP TEST. THE RELATIVELY RECENT TESTING WAS

FOR THE SOLE PURPOSE OF ADDRESSING THE OVERALL CONCENTRATION OF LEAD IN THE ENTIRE WASTE MATRIX.

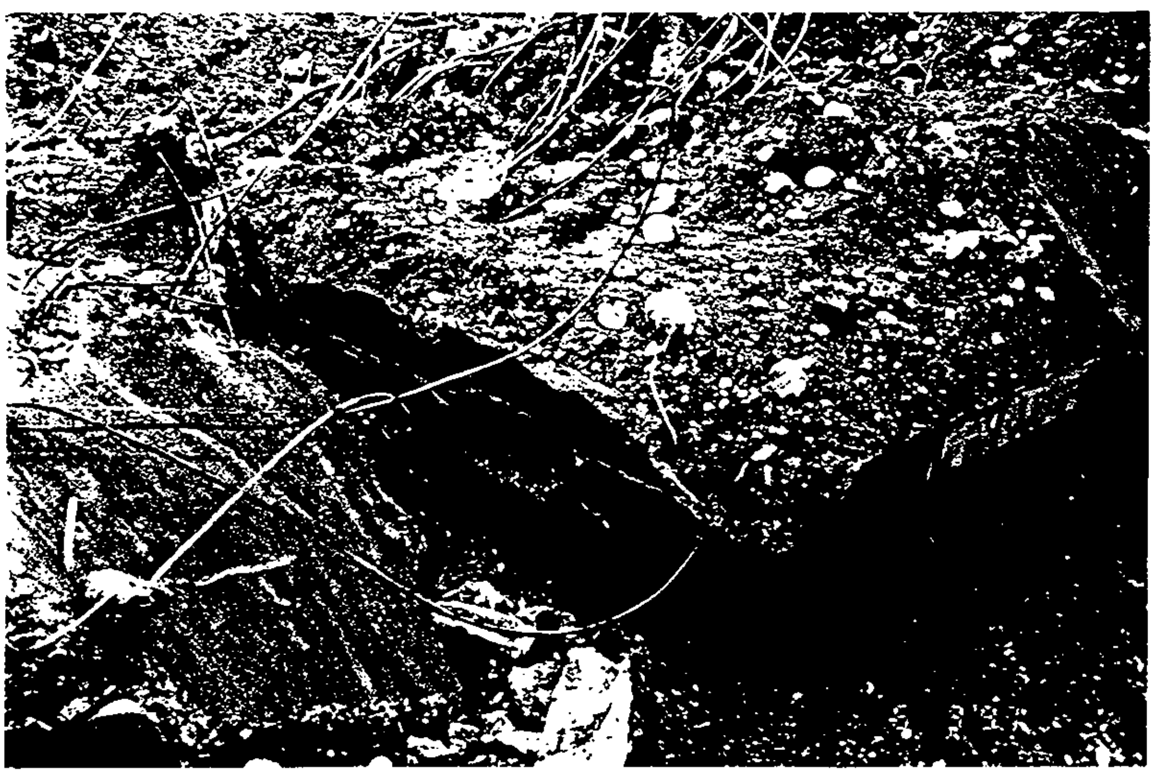
Ecology would like to be more involved with the actual field sampling step next time. WE TAKE NO EXCEPTIONS, THIS SITUATION REQUIRED IMMEDIATE SAMPLING ACTION AS WE WERE FORMULATING OUR METHODOLOGY, DUE TO OPPORTUNITY OF FIELD EXPOSURES, AND EXISTING SUBCONTRACTOR CONSTRUCTION SCHEDULE.

Jerry



Attachment 9

Attachment 9



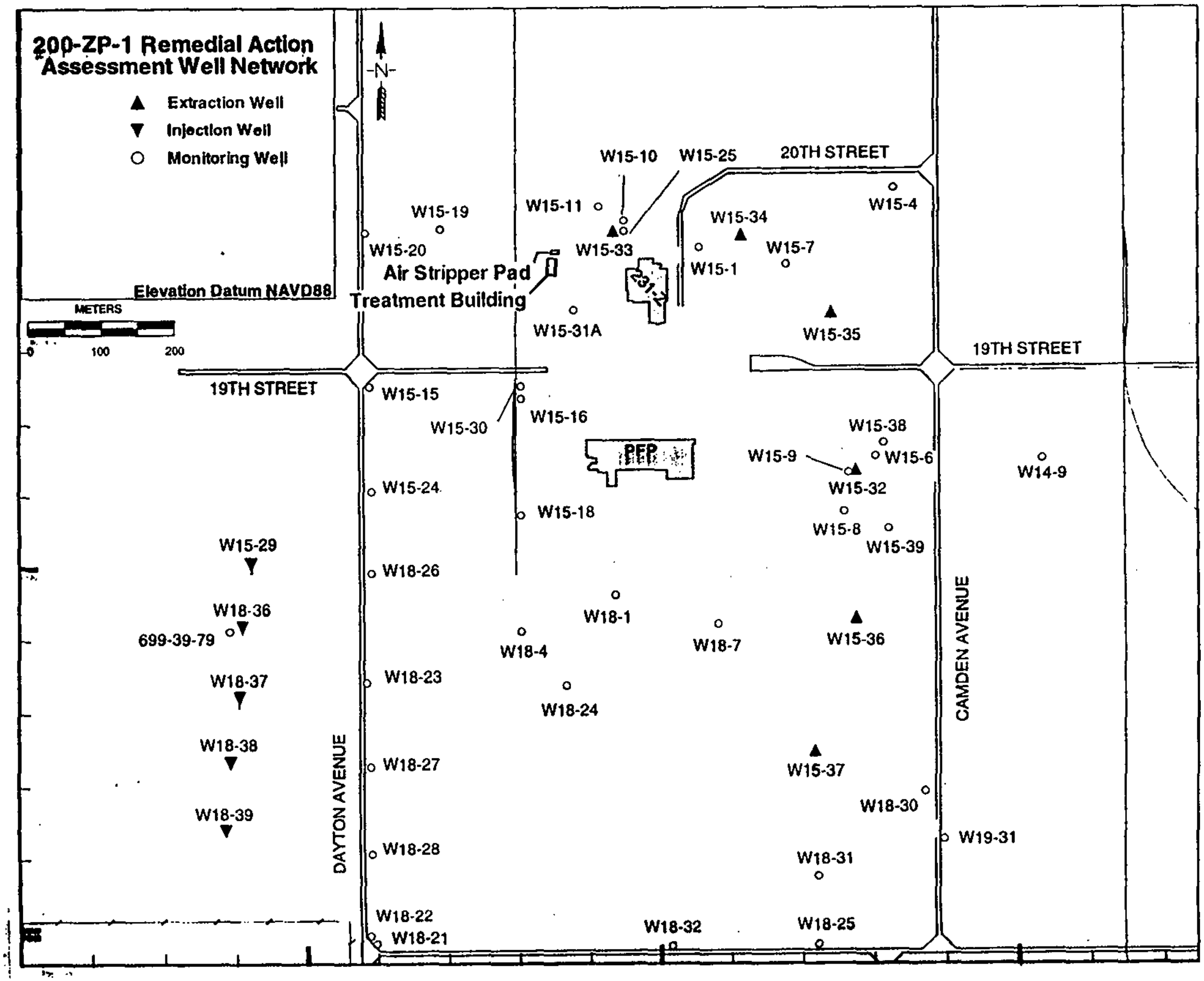


Figure 2-1. Plan View of the 200-ZP-1 Pump-and-Treat Site Showing Extraction, Injection, and Monitoring Well Locations.

Figure 2-4. Carbon Tetrachloride Concentrations at Extraction Wells 299-W15-32, 299-W15-33, and 299-W15-34.

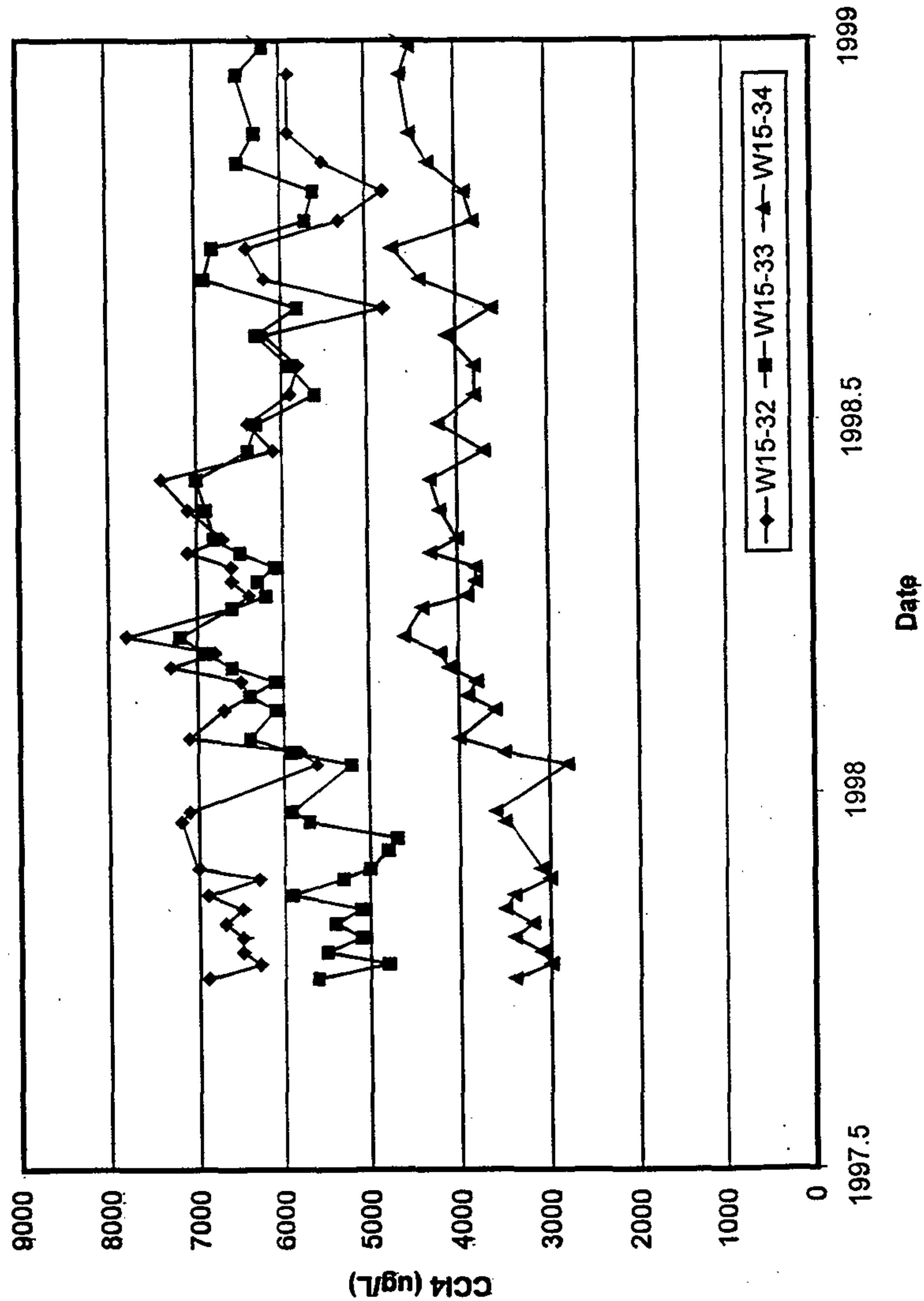
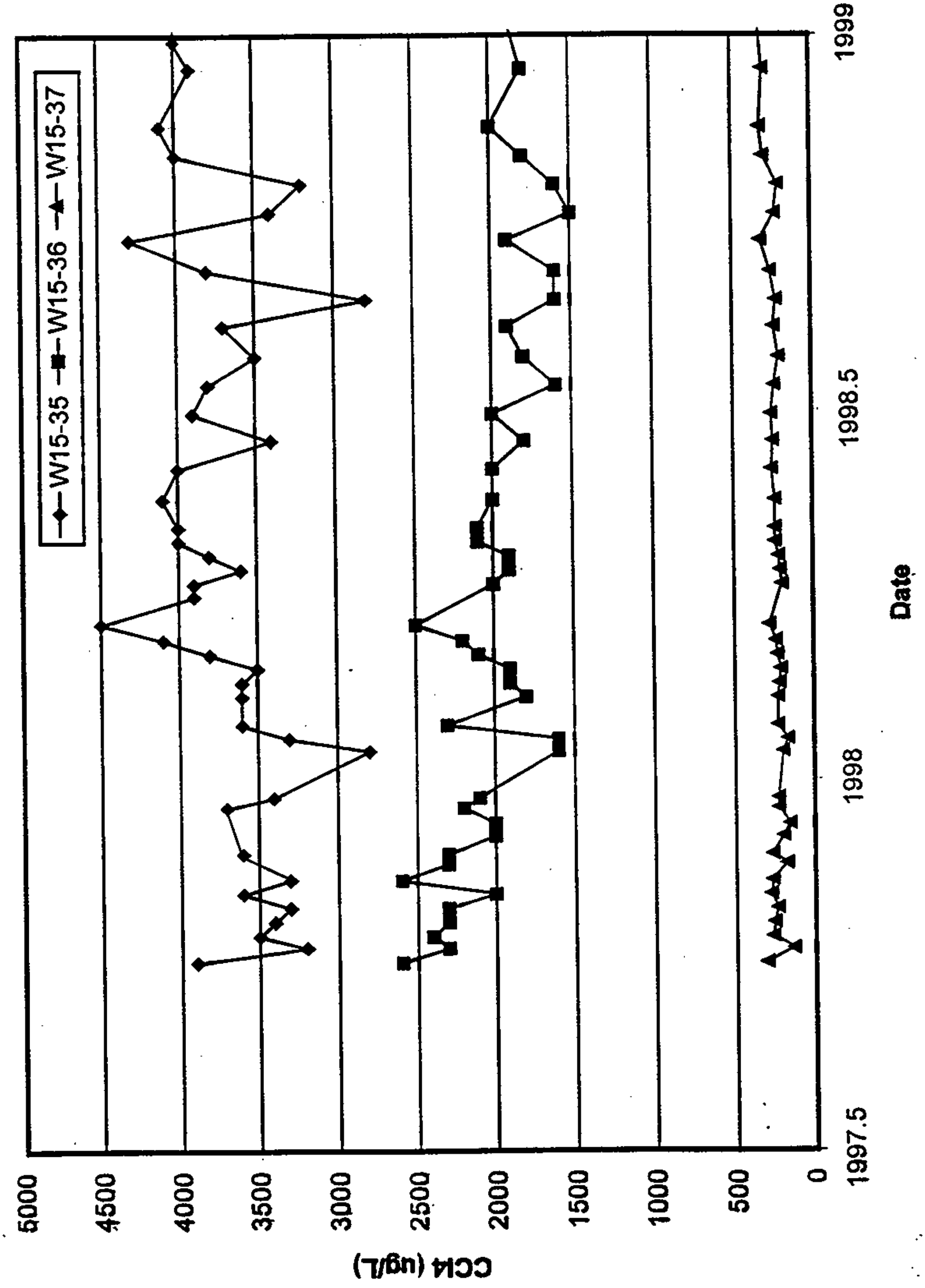


Figure 2-5. Carbon Tetrachloride Concentrations at Extraction Wells 299-W15-35, 299-W15-36, and 299-W15-37.



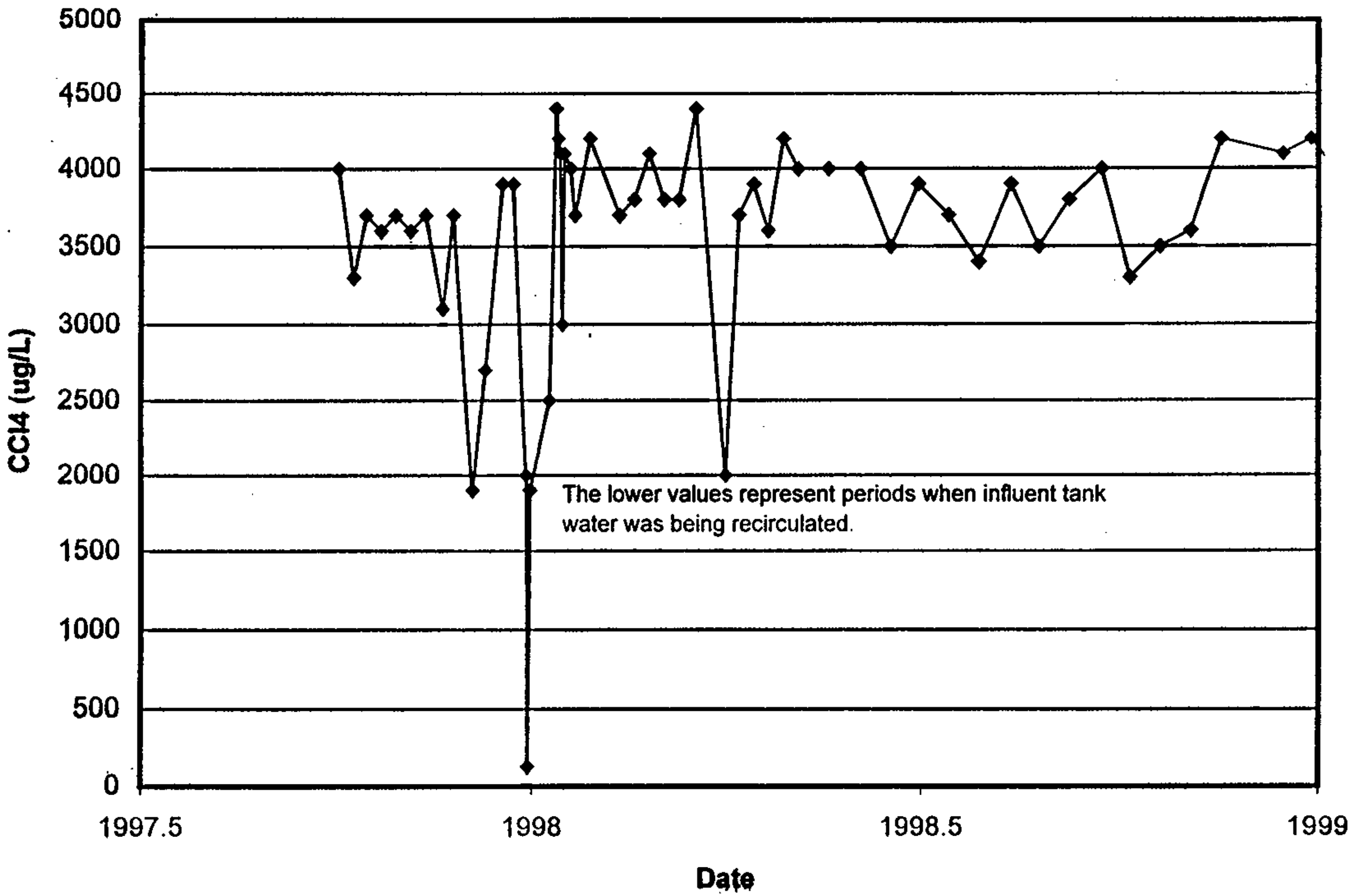
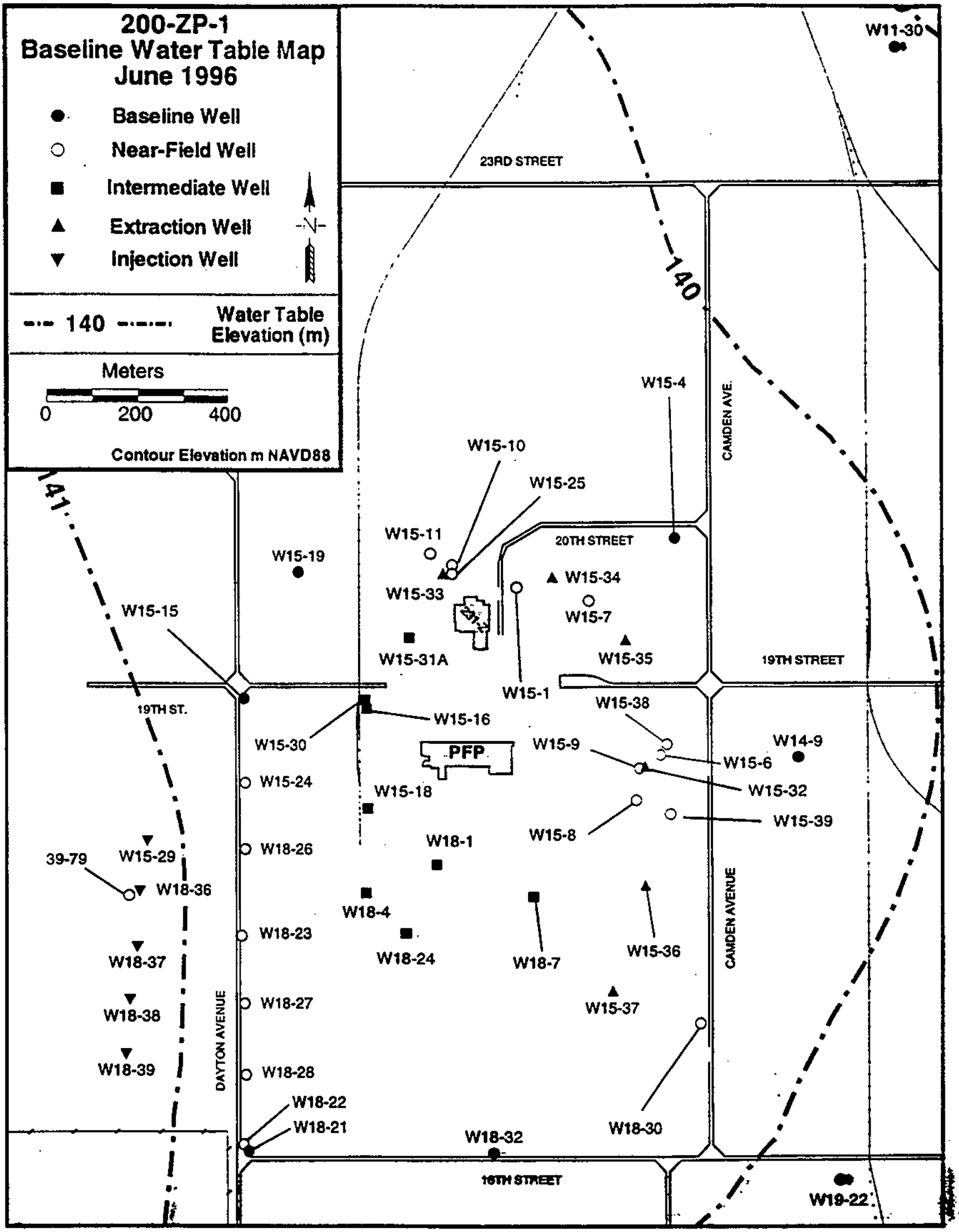


Figure 2-10. Carbon Tetrachloride Concentrations for Influent Tank T-01.

Figure 2-12. 200-ZP-1 Baseline Water Table, June 1996.



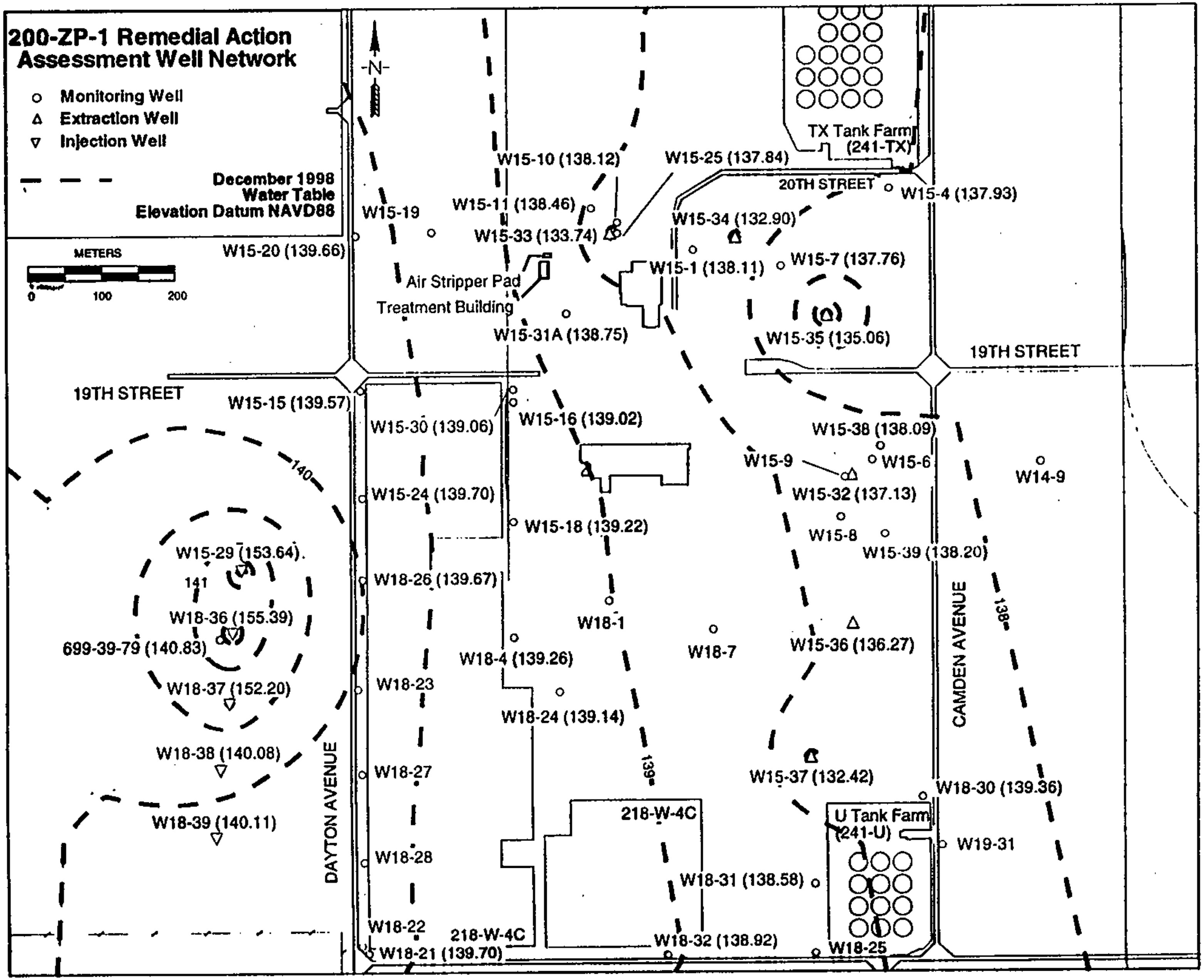
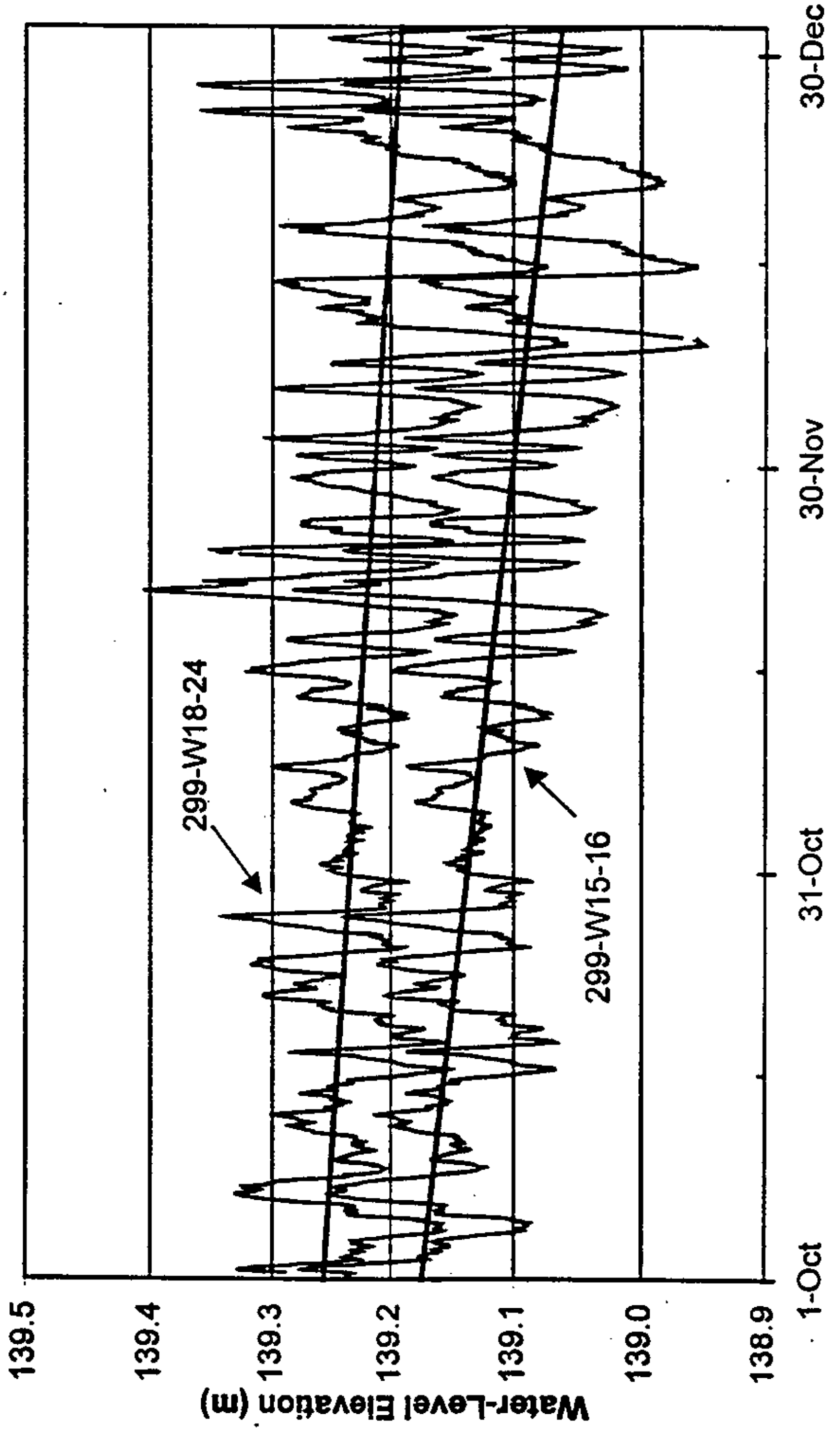


Figure 2-13. 200-ZP-1 Water Table for December 1998.

Figure 2-14. Estimated Water-Level Decline at 200-ZP-1.



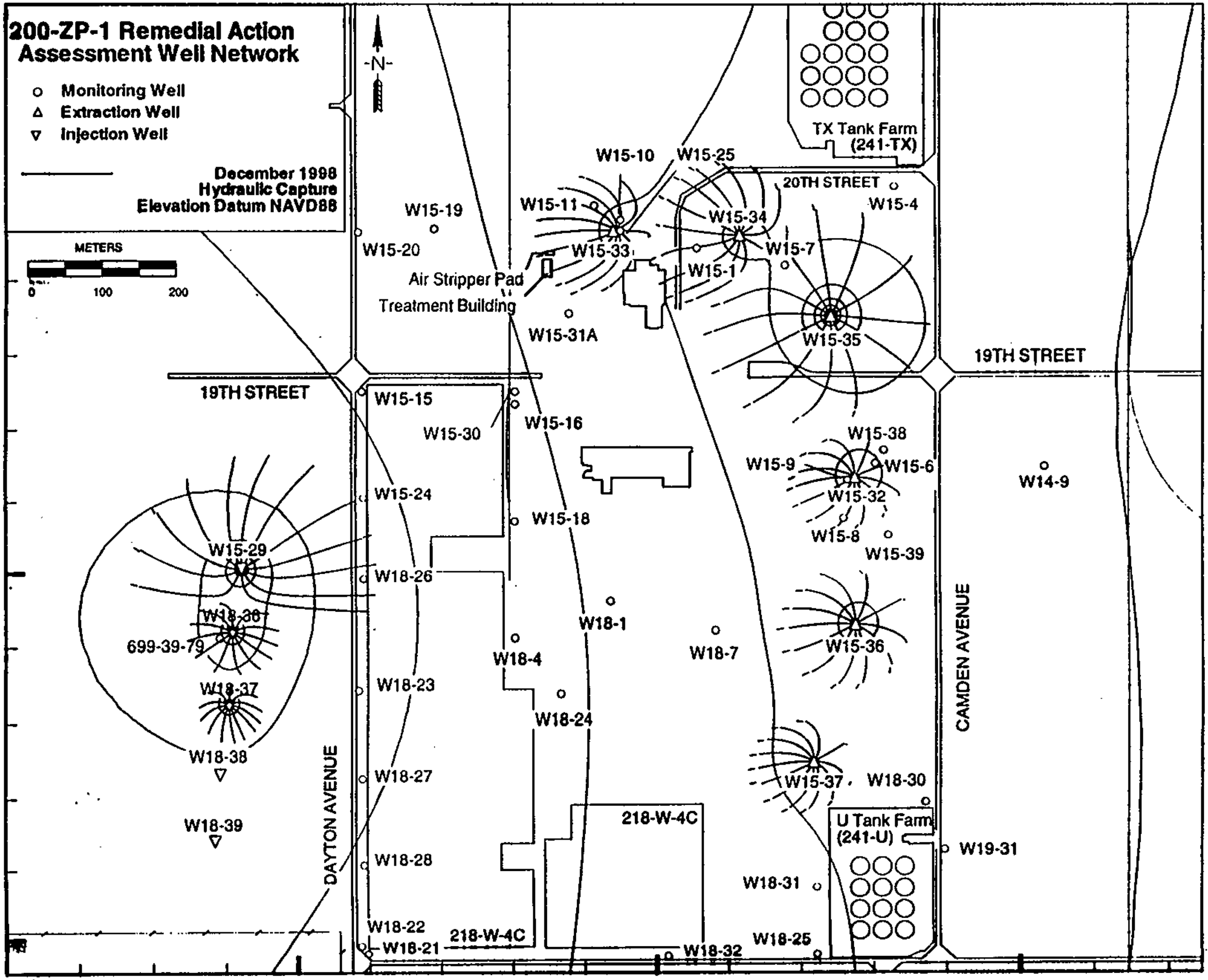


Figure 2-21. Hydraulic Capture Through December 1998.

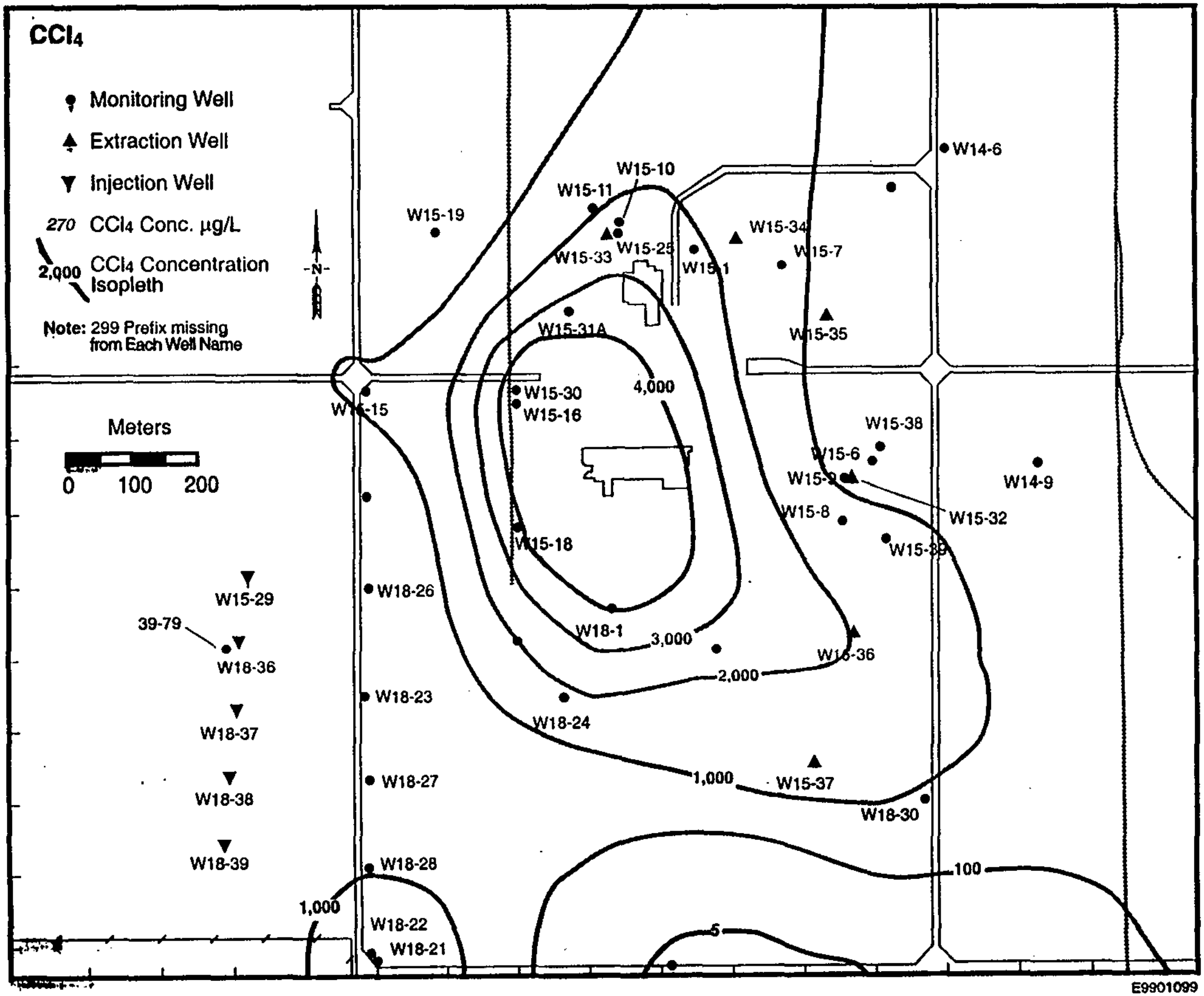


Figure 2.22. Rescaled Carbon Tetrachloride Remediation Area Baseline Plume Map, June 1996.

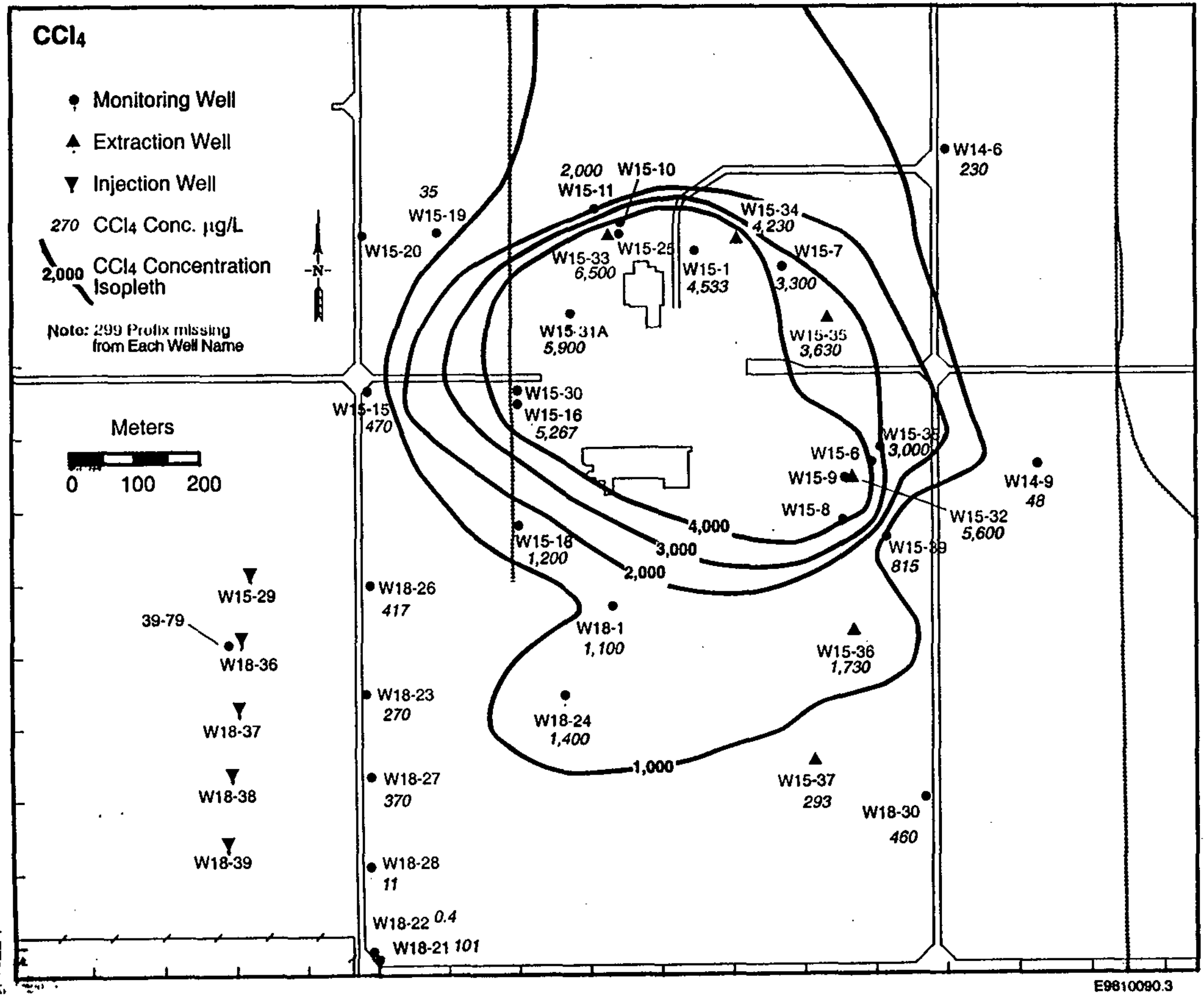


Figure 2-23. Carbon Tetrachloride Remediation Area Plume as of September 1998.

Table 2-1. Volume of Groundwater Treated and Mass of Carbon Tetrachloride Removed Since Startup of Operations at 200-ZP-1.

Reporting Period	Liters Treated	Mass of Carbon Tetrachloride Removed (kg)
August 1994 - July 1996	26,676,000	75.85
August 1996 – September 1996	33,232,327	60.96
October 1996 – December 1996	44,583,715	143.54
January 1997 - March 1997	69,869,604	237.2
April 1997 - June 1997	41,877,094	140.8
July 1997 – September 1997	62,469,305	228.8
October 1997 – December 1997	81,629,000	245.7
January 1998 - March 1998	72,791,000	279.5
April 1998 - June 1998	90,842,900	348.9
July 1998 – September 1998	90,899,200	338.1
October 1998 December 1998	83,552,570	315.57
Total	**698,422,670**	**2,414.8**

Table 2-2. Average Concentrations for Each of the Phase III Extractions Wells and the Influent Tank at 200-ZP-1 During the First Quarter of Fiscal Year 1999.

Well Name[a]	Minimum Value (µg/L)	Maximum Value (µg/L)	Mean Concentration FY98 (µg/L)	Mean Concentration 1st Qtr FY99 (µg/L)	Mean Flow Rate[b] (L/min)	Overall Change
299-W15-33	4,700	7,200	6,000	6,133	51	Higher
299-W15-34	2,800	4,700	3,770	4,267	80	Higher
299-W15-35	2,800	4,500	3,660	3,767	313	Higher
299-W15-32	4,800	7,800	6,560	5,480	55	Lower
299-W15-36	1,600	2,600	2,040	1,740	90	Lower
299-W15-37	140	320	235	272	50	Higher
Influent Tank	--	4,400	3,530	3,817	--	Higher

[a] Wells listed from north to south.

[b] Some discrepancies in discharge rate at the different measurement locations were observed. These are still being resolved. Flow rates may actually be higher by about 15% to 20%.

Attachment 11

Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites FY 1997 - FY 1999

200-ZP-2 Location (Well or Probe) /feet bgs	Site	Zone	November 1996 - July 1997 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	October 1997 - September 1998 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	July 1998 - February 1999 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound
79-06/ 5 ft	Z-1A	1	not measured		not measured		1.2	8
79-11/ 5 ft	Z-1A	1	0	8	0	6	2.9	8
86-06/ 5 ft	Z-9	1	1.3	8	0	9	1.5	5
87-09/ 5 ft	Z-1A	1	not measured		1.5	3	1.5	8
95-11/ 5 ft	Z-9	1	0	8	2.1	9	2.5	5
95-12/ 5 ft	Z-9	1	1.1	8	1.5	9	1.3	5
CPT-16/ 10 ft	Z-9	2	not measured		0	9	1.5	5
CPT-17/ 10 ft	Z-9	2	not measured		4.2	9	3.7	5
CPT-18/ 15 ft	Z-9	2	not measured		6.5	9	5.0	5
CPT-32/ 25 ft	Z-1A	2	not measured		9.1	6	7.4	8
CPT-30/ 28 ft	Z-18	2	not measured		not measured		0	8
CPT-7A/ 32	Z-1A	2	not measured		2.3	6	5.4	8
W15-82/ 82 ft	Z-9	2	28.9	8	5.5	9	46.4	5
W15-95/ 82 ft	Z-9	2	not measured		15.3	9	39.4	5
CPT-21A/ 86 ft	Z-9	2	221	8	206	9	148	5
CPT-28/ 87 ft	Z-9	2	280	8	230	9	203	5
CPT-9A/ 91 ft	Z-9	2	103	8	34.5	9	39.8	5
W18-252SST/ 100 ft	Z-1A	2	38.2	8	17.8	3	24	8
W18-152/ 113 ft	Z-12	2	46.8	8	11.1	3	33.3	8
W15-217/ 115 ft	Z-9	3	797	8	630	9	418	5
CPT-24/ 118 ft	Z-9	3	44.6	8	37.7	9	37.3	5
W18-158L/ 123 ft	Z-1A	3	not measured		143	3	288	8
W18-167/ 123 ft	Z-1A	3	322.8	8	79.7	3	228	8
W18-249/ 134 ft	Z-18	3	206	8	20.4	3	215	8
W18-248/ 136 ft	Z-1A	3	288	8	86.3	3	148	8
W15-6L/ 189 ft	Z-9	6	22.6	8	17.8	9	1.3	5
W15-9L/ 189 ft	Z-9	6	18.3	8	15.0	9	14.9	5
W18-7/ 200 ft	Z-1A	6	28.5	8	17.3	3	28.4	8
W18-6L/ 208 ft	Z-1A	6	36	8	31.3	6	14.5	8
W18-12/ 210 ft	Z-18	6	not measured		3.8	3	18.5	8

* - based on location (Z-1A/18/12 or Z-9) of monitoring point; specific points may be beyond SVE zone of influence during particular operating configurations
- Z-18 and Z-12 wells off-line Oct 96 - Apr 98
- CPT-1A, CPT-9A, and possibly CPT-7A appeared to be beyond SVE zone of influence in Oct 96 based on differential pressure (BHI-01105, p. 6-1)
- CPT-9A, CPT-21A, CPT-28 beyond SVE zone of influence in May 96 based on CCl4 concentrations and airflow modeling based on measured vacuums (BHI-01105, p. 6-1)

Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites July 1998 - February 1999

200-ZP-2								
Location		8/14/98	9/29/98	11/5/98	12/1/98	12/31/98	1/26/99	2/23/99
(Well or Probe)	Zone	(a)						
/feet bgs		CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4
		(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)
79-06/ 5 ft	1			0	0	0	0	1.2
79-11/ 5 ft	1	0	0	2.8	0	2.9	1.9	1.6
86-06/ 5 ft	1			---- (b)	0	0	0	1.5
87-09/ 5 ft	1	0	1.5	0	0	1.1	0	0
95-11/ 5 ft	1			0	0	1.5	2.5	---- (f)
95-12/ 5 ft	1			1.2	0	1.2	1.3	1.2
CPT-16/ 10 ft	2			1.5	0	0	0	1.0
CPT-17/ 10 ft	2			3.2	1.7	3.2	3.7	3.4
CPT-18/ 15 ft	2			0	0	5.0	4.5	4.6
CPT-32/ 25 ft	2	0	0	1.0	2.1	5.2	7.0	7.4
CPT-30/ 28 ft	2			0	0	0	0	0
CPT-7A/ 32	2	1.4	1.7	1.7	2.4	2.6	5.4	3.5
W15-82/ 82 ft	2			46.4	19.2	23.1	22.1(e)	24.6
W15-95/ 82 ft	2			39.4	25.4	37.3	28.1	30.6
CPT-21A/ 86 ft	2			126	74.6	140	148	142
CPT-28/ 87 ft	2			184	65.2	203	170	156
CPT-9A/ 91 ft	2			39.0	38.6	12.4	39.8	32.2
W18-252SST/ 100 ft	2	8.9	17.8	18.2	13.3	22.7	10.7	24.0
W18-152/ 113 ft	2	11.1	0	27.9	3.4	25.2	31.7	33.3
W15-217/ 115 ft	3			---- (c)	26.8	339	348(e)	418
CPT-24/ 118 ft	3			37.1	37.3	33.5	20.9	21.3
W18-158L/ 123 ft	3	---- (d)	143	172	172	---- (d)	267	288
W18-167/ 123 ft	3	---- (d)	79.7	127	205	---- (d)	228	218
W18-249/ 134 ft	3	---- (c)	20.4	215	23.3	208	188	139
W18-248/ 136 ft	3	7.1	86.3	93.5	98.0	138	136	148
W15-6L/ 189 ft	6			---- (c)	0	1.3	1.1	1.2
W15-9L/ 189 ft	6			---- (c)	14.6	14.9	14.1	14.9
W18-7/ 200 ft	6	0	17.3	22.5	21.8	26.7	26.4	28.4
W18-6L/ 208 ft	6	4.3	14.5	---- (c)	---- (c)	---- (c)	---- (c)	---- (c)
W18-12/ 210 ft	6	1.2	3.8	7.5	12.0	13.6	12.2	18.5

(a) sampled 8/14/98; analyzed 8/15/98

(b) probe 86-07R destroyed; substitute probe 86-06 after 11/98

(c) not in service

(d) access to Z-1A unavailable (no key)

(e) opened for vertical velocity profiling 1/6/99-1/19/99

(f) probe 95-11 clogged; substitute probe 94-02 after 2/99

SOIL VAPOR EXTRACTION OPERATING PLAN AT 216-Z-9

Fifteen on-line wells are identified for potential vapor extraction in the attached list of extraction wells for Z-9. All of these wells will be prepared for potential hook-up to the soil vapor extraction system in April-June 1999.

The March 1999 non-operational soil vapor monitoring will take place at Z-9 on 3/22/99. On 3/23/99, the sampling tubes will be removed from wells W15-6L, W15-9L, W15-217, W15-82, and W15-95. The current wellhead assemblies (configured for non-operational soil vapor monitoring) will not be disturbed until the monitoring has been completed and the tubing removed on 3/23/99.

For initial start-up operations at Z-9, extraction will be implemented at four intervals: W15-217, W15-82, W15-9U, and W15-9L. These are the same wells used for initial operations at Z-9 in July 1998. During non-operational monitoring since October 1998, the highest carbon tetrachloride concentrations (maximum 418 ppmv) have been observed at well W15-217.

These four intervals will be characterized on the first day of operations. During continued operations, all on-line wells will be characterized each week and all off-line wells, if requested, will be characterized during the 2nd, 4th, 8th, and final weeks, according to the attached sampling and analysis plan. As before, we will plan to periodically change the mix of on-line wells during operations, based on changing concentrations, extraction interval locations, and operating experience. In general, the initial extraction wells will be nearer the carbon tetrachloride source (crib) and wells added later will expand operations away from the source.

Extraction Wells for FY 99 Soil Vapor Extraction System Operations at Z-9		
Potential On-Line Wells	**Reason**	**Initial Wells**
April - June 1999		
W15-6L	protection of groundwater	
W15-9L	protection of groundwater	X
W15-216L	protection of groundwater	
W15-218L	protection of groundwater	
W15-219L	protection of groundwater	
W15-220L	protection of groundwater	
W15-9U	mass removal	X
W15-82	mass removal	X
W15-84	mass removal	
W15-85	mass removal	
W15-86	mass removal	
W15-95	mass removal	
W15-216U	mass removal	
W15-217	mass removal	X
W15-218U	mass removal	
Potential Off-Line Wells		
for Characterization		
W15-6U		
W15-219U		
W15-220U		
W15-223		

Sampling and Analysis Plan for ZP-2 SVE Operations April 1999										
When to Monitor	Approximate	on-line wells	off-line wells*	vacuum		flow	CCl4	CHCl3	CH2Cl2	MEK
	Date			wellhead	system		carbon	chloroform	methylene	MEK
							tetrachloride		chloride	
first day of operations	4/1/99	X		X	X	X	X	X	X	X
beginning of 1st week	4/5/99	X		X	X	X	X	X	X	X
beginning of 2nd week	4/12/99	X	X	X	X	X	X	X	X	X
beginning of 3rd week	4/19/99	X		X	X	X	X	X	X	X
beginning of 4th week	4/26/99	X	X	X	X	X	X	X	X	X
beginning of 5th week	5/3/99	X		X	X	X	X	X	X	X
beginning of 6th week	5/10/99	X		X	X	X	X	X	X	X
beginning of 7th week	5/17/99	X		X	X	X	X	X	X	X
beginning of 8th week	5/24/99	X	X	X	X	X	X	X	X	X
beginning of 9th week	6/1/99	X		X	X	X	X	X	X	X
beginning of 10th week	6/7/99	X		X	X	X	X	X	X	X
beginning of 11th week	6/14/99	X		X	X	X	X	X	X	X
beginning of 12th week	6/21/99	X		X	X	X	X	X	X	X
last day of operations	6/28/99	X	X	X	X	X	X	X	X	X
Fax copy of monitoring records to Virginia Rohay at 372-9098 by close of day following monitoring.										
* optional as requested										

Attachment 12

VADOSE ZONE MONITORING PLAN FOR 216-Z-1A, APRIL 1999 THROUGH JUNE 1999

Scope: Monitor carbon tetrachloride soil vapor concentrations at selected probes and wells at Z-1A during soil vapor extraction (SVE) operations at Z-9. The components of this scope are:

- collect soil vapor samples using the rebound study sampling method and sampling pump (BHI-00947)
- analyze soil vapor samples for carbon tetrachloride using B&K at field screening level (quality control level QC-1 as defined in BHI-QA-03)
- evaluate concentration trends
- report results to 200-ZP-2 Unit Managers

Purpose: (1) To be cognizant of carbon tetrachloride concentrations and trends at the vadose-atmosphere and vadose-groundwater interfaces to ensure that non-operation of SVE systems is not negatively impacting groundwater or atmosphere. (2) To be cognizant of carbon tetrachloride concentrations and trends near the lower permeability Plio-Pleistocene layer to provide an indication of concentrations that can be expected during restart of SVE operations and to support selection of on-line wells.

Duration: Three months, April 1999 through June 1999.

Monitoring Frequency: Monthly. It is assumed that a sampler will spend 8 hrs/month for collection and analysis of samples and that a project scientist will spend 4 hrs/month for evaluation and reporting of results. Based on the rebound study and FY98 monitoring experiences, sampling and analysis of 25-30 samples is reasonable for an 8-hour day.

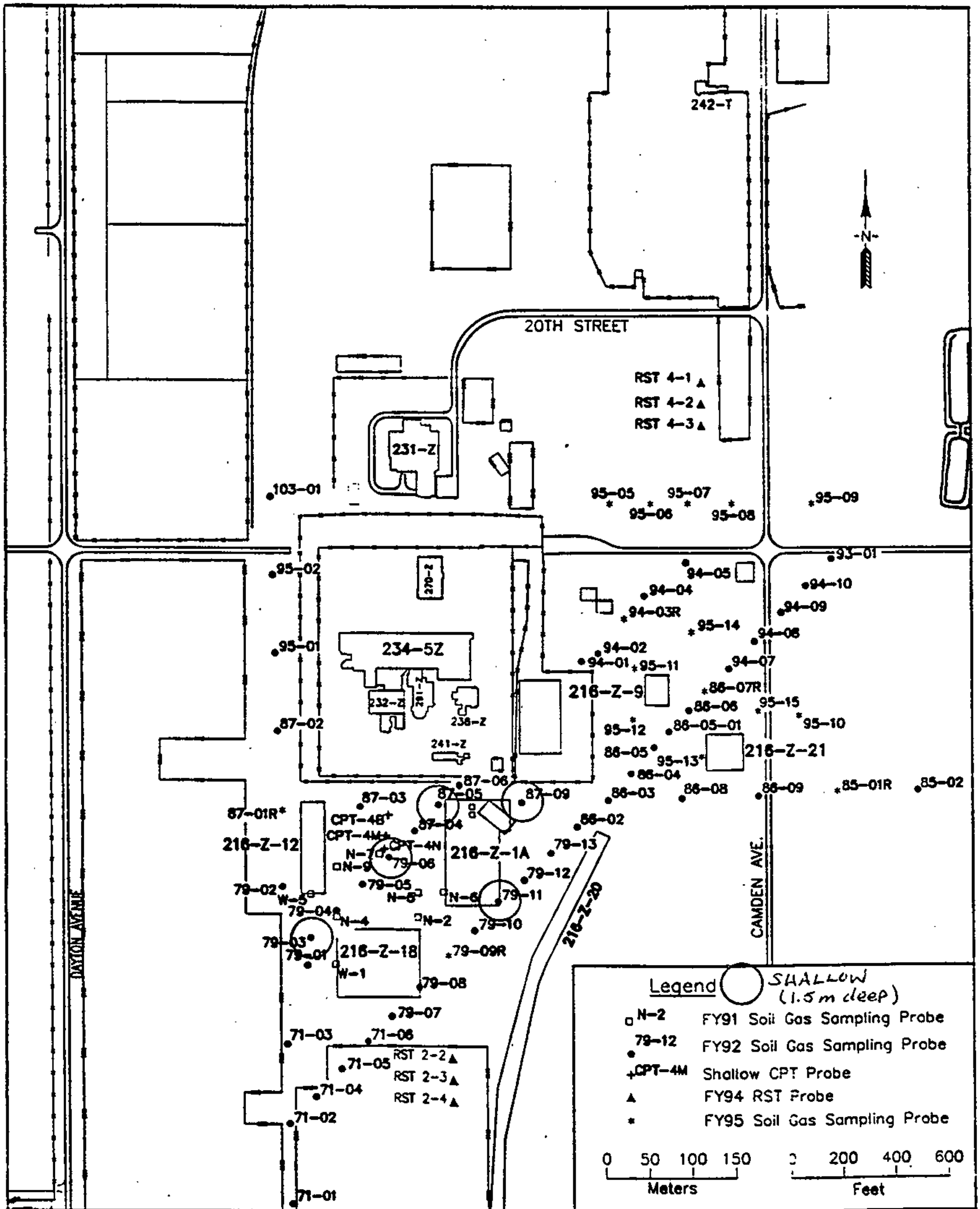
Monitoring Locations: Locations were selected to focus carbon tetrachloride monitoring near the vadose-atmosphere interface and near the Plio-Pleistocene layer. Carbon tetrachloride monitoring near the vadose-groundwater interface at Z-1A will be conducted as part of passive soil vapor extraction monitoring. At the recommendation of the project scientist, and with approval from the BHI task lead, these monitoring locations could be revised based on developing trends, accessibility, and/or recommendations of the sampler.

Target Zone (depth)	Z-1A	Z-9	Total
Shallow (1.5 m)	5	0	5
Near surface (3-24 m)	12	0	12
Plio-Pleistocene (25-45 m)	8	3	11
Groundwater (55-65 m)	(8*)	0	(8*)
Total	25	3	28

*selected for passive soil vapor extraction monitoring

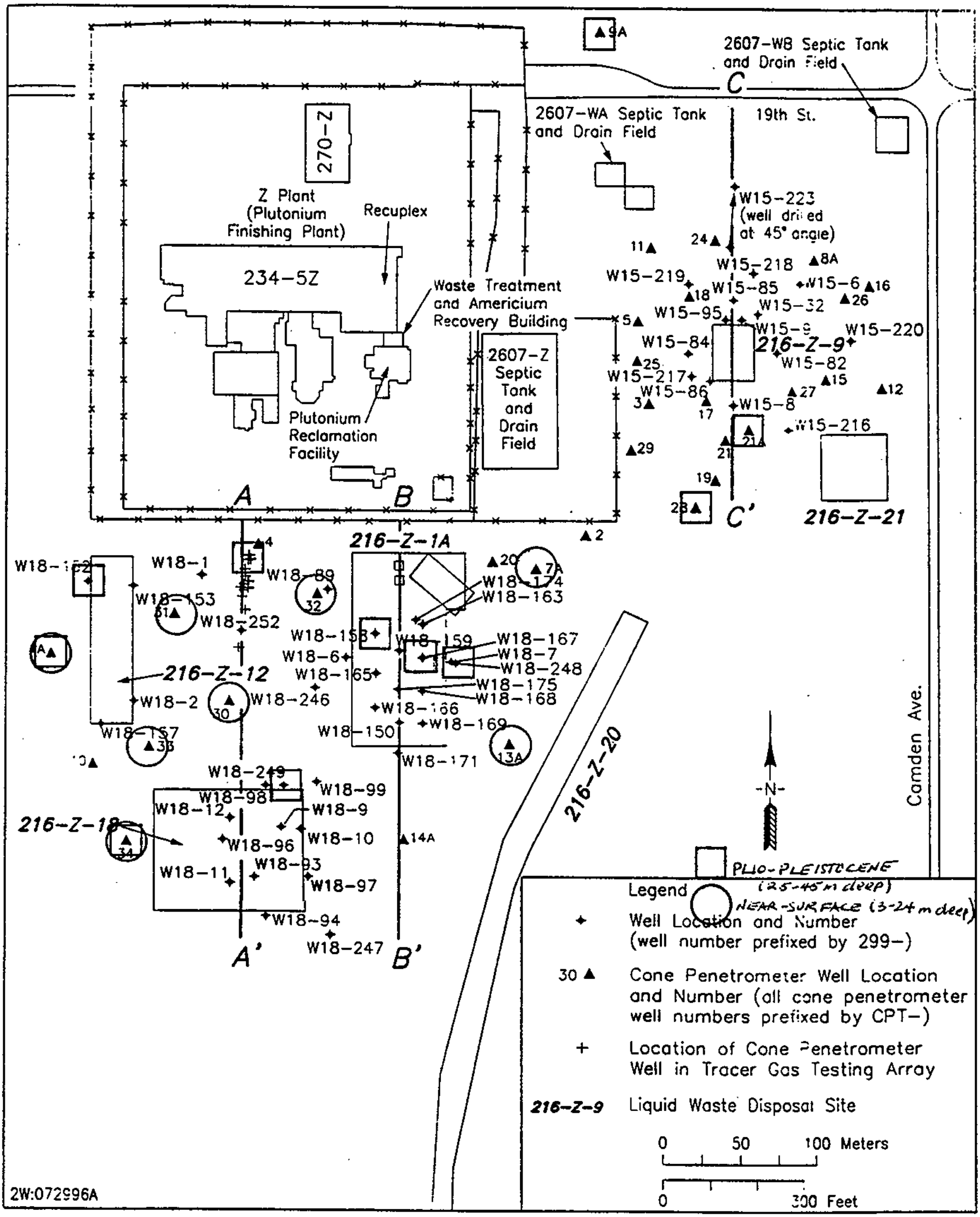
200-ZP-2				Z-1A & Z-9	Z-9	Z-1A	Z-1A & Z-9	Z-1A
Location				1997-1998	1998	1998	1998-1999	1999
(Well or Probe)	Site	Depth	Zone	Oct-Mar	Apr-Jun	Jul-Sep	Oct-Mar	Apr-Jun
/feet bgs		(m)						
79-03/ 5 ft	Z-18	1.5	1			X		X
79-06/ 5 ft	Z-1A	1.5	1				X	X
79-11/ 5 ft	Z-1A	1.5	1	X		X	X	X
86-06/ 5 ft	Z-9	1.5	1	X	X		X	
87-03/ 5 ft	Z-18	1.5	1	X		X		
87-05/ 5 ft	Z-1A	1.5	1			X		X
87-09/ 5 ft	Z-1A	1.5	1	X		X	X	X
94-09/ 5 ft	Z-9	1.5	1	X	X	X		
95-11/ 5 ft	Z-9	1.5	1	X	X		X	
95-12/ 5 ft	Z-9	1.5	1	X	X		X	
N-6/ 5 ft	Z-1A	1.5	1	X				
CPT-13A/ 9 ft	Z-1A	2.7	2	X	X	X		X
CPT-16/ 10 ft	Z-9	3.0	2	X	X		X	
CPT-17/ 10 ft	Z-9	3.0	2	X	X		X	
CPT-18/ 15 ft	Z-9	4.6	2	X	X		X	
CPT-31/ 25 ft	Z-1A	7.6	2	X		X		X
CPT-32/ 25 ft	Z-1A	7.6	2	X		X	X	X
CPT-30/ 28 ft	Z-1A	8.5	2				X	X
CPT-7A/ 32	Z-1A	9.8	2	X		X	X	X
CPT-1A/ 35 ft	Z-1A	10.7	2	X	X	X		X
CPT-33/ 40 ft	Z-1A	12.2	2	X		X		X
CPT-34/ 40 ft	Z-18	12.2	2					X
CPT-21A/ 45 ft	Z-9	13.7	2	X	X			
CPT-9A/ 60 ft	Z-9	18.3	2	X	X	X		
CPT-28/ 60 ft	Z-9	18.3	2	X	X	X		
CPT-30/ 68 ft	Z-1A	20.7	2					X
CPT-13A/ 70 ft	Z-1A	21.3	2					X
CPT-24/ 70 ft	Z-9	21.3	2		X			
CPT-31/ 76 ft	Z-1A	23.2	2					X
CPT-33/ 80 ft	Z-1A	24.4	2					X
W15-82/ 82 ft	Z-9	25.0	2		X		X	
W15-95/ 82 ft	Z-9	25.0	2		X		X	
CPT-21A/ 86 ft	Z-9	26.2	2		X		X	X
CPT-34/ 86 ft	Z-18	26.2	2			X		X
CPT-28/ 87 ft	Z-9	26.5	2		X		X	X
CPT-1A/ 91 ft	Z-1A	27.7	2					X
CPT-4A/ 91 ft	Z-1A	27.7	2			X		X
CPT-9A/ 91 ft	Z-9	27.7	2		X		X	X
W18-252SST/ 100 ft	Z-1A	30.5	2			X	X	
CPT-4F/ 109 ft	Z-1A	33.2	2			X		
W18-152/ 113 ft	Z-12	34.4	2			X	X	X
W15-217/ 115 ft	Z-9	35.1	3		X		X	
CPT-24/ 118 ft	Z-9	36.0	3		X		X	
W18-158L/ 123 ft	Z-1A	37.5	3			X	X	X
W18-167/ 123 ft	Z-1A	37.5	3			X	X	X
W18-249/ 134 ft	Z-18	40.8	3			X	X	X
W18-248/ 136 ft	Z-1A	41.5	3			X	X	X
W15-216L/ 184 ft	Z-9	56.1	5	X	X			
W15-6L/ 189 ft	Z-9	57.6	6	X	X		X	
W15-9L/ 189 ft	Z-9	57.6	6	X	X		X	
W18-7/ 200 ft	Z-1A	61.0	6	X		X	X	
W18-6L/ 208 ft	Z-1A	63.4	6	X		X	X	
W18-12/ 210 ft	Z-18	64.0	6			X	X	

Location of Shallow Probes Selected for Monitoring at 200-ZP-2, April 1999 through June 1999



2W\0927958

Location of Near-Surface and Plio-Pleistocene Probes and Wells Selected for Monitoring at 200-ZP-2, April 1999 through June 1999



PLAN FOR PASSIVE SOIL VAPOR EXTRACTION AT 200-ZP-2

- **Passive soil vapor extraction uses naturally-induced pressure gradients to drive contaminated soil vapor through wells to the surface for treatment.**

- **Passive extraction systems will be implemented on selected wells. The wells will be monitored to determine the mass of carbon tetrachloride removed; removal will be maximized using engineered enhancements.**

- **The well network will consist of 8 deep extraction wells and 15 additional monitoring wells and probes at the 216-Z-1A/Z-18 site.**

The proposed passive soil vapor extraction well network is provided in Table 1; well locations are shown on Figure 1. Deep wells (those open in the vadose zone below the caliche layer, near the water table) have been selected as the initial passive extraction wells for the following reasons:

1. Because the wells are open below the caliche layer (confining unit), the differential pressures driving passive extraction are higher.
2. Because the differential pressures are higher, the Savannah River Site "baroball" (which has a relatively higher cracking pressure, 0.15 in. w.c.) can be used as a one-way, flow-activated valve; the 200-ZP-2 project has seven baroballs available.
3. Because the wells are all screened near the groundwater, potential migration of carbon tetrachloride from the vadose zone to groundwater may be reduced or reversed.
4. Because the wells are all screened near the groundwater, carbon tetrachloride removal from near the groundwater will be maintained over a longer period of time (relative to the 3-month operation of the active soil vapor extraction system).
5. Because all the deep wells will be used for passive soil vapor extraction, the active soil vapor extraction can be focused on the higher concentrations wells associated with the caliche layer.
6. Because the caliche layer provides a barrier to flow, operation of the active soil vapor extraction system on the shallower wells will minimize interruption of passive extraction below the caliche.
7. Because the vapor concentrations observed in deep wells tend to be relatively uniform, extrapolation of the measured parameters at three wells to all of the wells may introduce less error.
8. Because water level measurements are being recorded for nearby 200-ZP-1 wells (e.g., 299-W18-24, 299-W18-1), fluctuations in water levels, atmospheric pressure, and soil vapor pressures can be compared to enhance understanding of groundwater-vadose interactions.

- **One or more shallow extraction wells (those open in the vadose zone above the caliche layer) may be added to the network in the future. An impermeable surface cover may be placed around a shallow well to test its ability to enhance extraction from the well.**

- **Three passive extraction wells will be monitored hourly for pressures, flow, and concentrations; all 8 passive extraction wells will vent through GAC. The 15 monitoring wells and probes will be monitored for pressures.**

- **During FY 1999, data will be reported at Unit Manager meetings. It is anticipated that the detailed evaluation of the data will be presented in a separate report or included in the annual 200-ZP-2 performance evaluation report in FY 2000.**

- **Passive soil vapor extraction operations will begin in April 1999 and continue through at least September 1999.**

- **The 14.2 m^3/min soil vapor extraction system will be used at Z-1A to extract from higher concentration wells associated with the silt/caliche zone; passive systems will continue to be used to extract from lower concentration wells below the silt/caliche zone.**

Figure 1. Locations of Passive Soil Vapor Extraction Wells

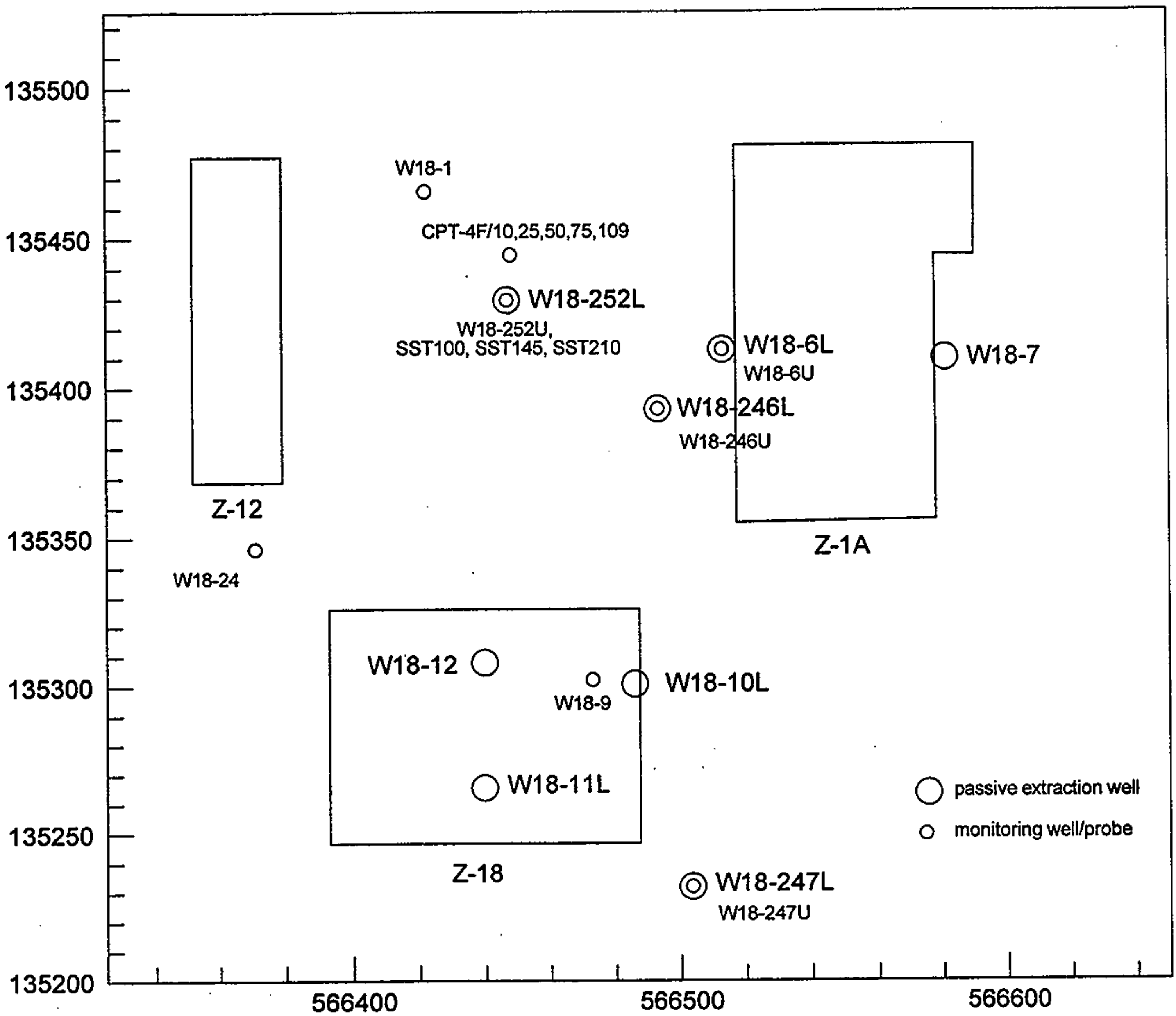


Table 1. Proposed Passive Soil Vapor Extraction Well Network

Well/Probe	Purpose	Open Interval (ft bgs)
299-W18-6L	passive extraction	190 – 201
299-W18-6U	monitoring	94.5 – 124.5
299-W18-7	passive extraction	168.5 – 203
299-W18-9	monitoring	180 – 211.5
299-W18-10L	passive extraction	147 – 211
299-W18-11L	passive extraction	180 – 213
299-W18-12	passive extraction	177.5 – 213
299-W18-246L	passive extraction	165 – 175
299-W18-246U	monitoring	120 – 130
299-W18-247L	passive extraction	162 – 172
299-W18-247U	monitoring	119 – 129
299-W18-252L	passive extraction	165 – 185
299-W18-252U	monitoring	113 – 133
299-W18-252/SST100	monitoring	100
299-W18-252/SST145	monitoring	145
299-W18-252/SST210	monitoring	210
CPT-4F/10	monitoring	10
CPT-4F/25	monitoring	25
CPT-4F/50	monitoring	50
CPT-4F/75	monitoring	75
CPT-4F/109	monitoring	109
W18-24	monitoring	205.5 – 235.5
W18-1	monitoring	195 – 425

RCRA Groundwater Monitoring at the 216-B-3 Pond Facility

D. B. Barnett
Pacific Northwest National Laboratory

Unit Manager Meeting
March 18, 1999

Attachment 15

Facility Overview

- Located east of 200 East Area and originally consisted of a main pond (natural depression), feeder ditches, and three expansion ponds (see p. 11)

- Main Pond began operating in 1945 until 1994 (interim stabilized); the expansion ponds were clean-closed in 1994 (see p. 12 for timeline of significant B Pond events).

- Aqueous wastes were conveyed to the facility via open ditches and pipelines.

  - Received wastewater from 200 East Area facilities (e.g., B Plant, PUREX chemical sewers and cooling water, 244-AR Vault and 284-E Powerhouse effluents, 283-E Water Treatment Facility filter backwash).

  - Total discharges to the facility are estimated to have been ~1.0E+12 liters (~2.6E+11 gal)(see p. 13 for discharge history).

- Volumetrically significant hazardous wastes discharged to the main pond include nitric acid, sulfuric acid, sodium hydroxide, ammonium fluoride, ammonium nitrate, and cadmium nitrate. Last release of waste occurred in 1987 (sodium nitrate) (DOE/RL 1994a).

- Radionuclide releases were associated mostly with unplanned releases from PUREX and B Plant. Known and potential wastes sent to the B Pond System are listed on p. 14.

- RCRA groundwater monitoring began in 1988 in interim-status detection, went into assessment in 1990 (TOX), and was returned to detection in early 1998.

Summary of Soil Contamination Analyses

- Results of soil contamination investigations, conducted in three phases between 1989 and 1992, are reported in DOE/RL (1994) and Kramer (1991), and summarized in Barnett and Chou (1998).
  - First phase focused on shallow soil sampling of main and expansion ponds and 216-B-3-3 Ditch. Background samples were also analyzed.
  - Second and third phases consisted of shallow and deep vadose-zone sampling in the expansion ponds (one borehole to groundwater in each)
  - Analytes included comprehensive list of organic and inorganic constituents, metals, and radionuclides, based on known or suspected waste stream components.
- Analytical results on soils indicated little contamination.
  - Copper, lead, zinc, antimony, chromium, cadmium, and mercury were found above background ("threshold") levels, but were below MTCA cleanup standards appropriate for nonresidential use. Beryllium was above MTCA levels (method B) in some samples, but below background levels.
  - Antimony, mercury, selenium, thallium, and cyanide were detected, but were below either background levels or quantitation limits.
  - All (Appendix VIII 40 CFR 261) organic constituents were below detection or CRQL.
  - Gross alpha was highest (42.59 pCi/g) in a sample from 102 ft beneath the 3A pond. The highest gross beta result (718 pCi/g) was found in surface samples from 3C Pond. A maximum ^{90}Sr result (36.5 pCi/g) was found at a depth of 7.5 ft at the 3B pond. A ^{90}Sr result of 36.1 pCi/g was also produced from the 97 ft depth at the 3A pond.

Hydrogeologic Setting

- Discharges since the mid 1940s, particularly during the 1980s, caused the formation of a groundwater mound in the vicinity of B Pond. The mound (pp. 15 and 16) has influenced hydrology around the 200 East Area and beyond. The mound and it's effects on water levels in B Pond wells have generally been subsiding since RCRA groundwater monitoring began in 1988, with a short period of recovery during the mid 1990s (see hydrographs, p. 17). Well pairs indicate that a downward gradient still exists in most locations around the facility.

- The aquifer occurs primarily in the Ringold unit A, except in the Hanford formation around the main pond and western portions of the regulated unit. The aquifer becomes progressively confined from north to south/southeast, mostly because of the Ringold lower mud unit (see cross section p. 18).

- Groundwater has been interpreted to flow "radially" outward from the apex of the groundwater mound. This apex is offset from the surface sources of effluent, possibly because of engineering features of the facility and/or vadose zone stratigraphy.

- Groundwater flow rates have been estimated to range from 0.009 m/d in the Ringold Formation, to 46m/d in the Hanford formation. These rates are based on a range of hydraulic conductivity from 640 m/d (Hanford formation) to ~1 m/d (Ringold Formation).

- Recent hydrostratigraphic research on the area around B Pond suggests a more complex flow pattern. The Ringold lower mud unit may significantly constrain flow potential to the south/southeast. Geochemical character of groundwater in this region supports this inference (p. 19, Barnett 1998b)

RCRA Groundwater Monitoring

- Groundwater monitoring began in 1988 under a RCRA interim status, detection level (indicator-parameter evaluation) program.
- Wells were added to the network from 1988 through 1992. The maximum number of wells in the network at one time was 25 (including 2 upgradient wells and 3 wells shared with the 200 Area TEDF—see p. 11). Shallow and "deep" completions exist for four locations.
- Assessment monitoring began in 1990 when two wells, 699-43-41E and 699-43-41F, produced results for total organic halogens (TOX) above the established critical means, and concomitantly high total organic carbon results.
- Comprehensive constituent list (p. 20) was used for 6 years; each well was sampled at least once for appendix IX constituents.
- In 1995 the groundwater monitoring plan (GWMP) was revised (Sweeney 1995) to address changes in the well network and refocus analytical efforts on suspect constituents.
- From 1990 through 1997 the facility remained in assessment status (problems with laboratory deficiencies, and TOX analyses slowed research).
- An assessment report (Barnett and Teel 1997) was issued in June 1997 which concluded very limited impact on groundwater by the facility (see p. 6).
- A revised monitoring plan (Barnett and Chou 1998) was issued in June 1998 predicated on Data Quality Objectives (DQO) process and improved monitoring/statistical methods recommended by EPA/ASTM. This plan has not been approved by Ecology.
- Interim Change Notices (ICN) were issued in 1998 and 1999 to address changes in the network and schedule.

Attachment 15

Groundwater Monitoring Results

- To date, ~70,000 analytical results have been received for B pond wells (including the extended network, TEDF, etc.)
-
- Results of Groundwater Quality Assessment:
    - No compound was correlated to elevated TOX (or TOC).
    - Tris 2-chloroethyl phosphate ("TRIS2CH" = $[ClC_2H_4O]_3$ PO) was identified as a possible *contributor* to TOX levels (see p. 21). This compound (not a hazardous waste) is associated with plastics manufacturing and possibly well-construction materials.
    - Elevated levels of TOX with no corresponding TRIS2CH detections and a lack of correlation between TRIS2CH and TOX suggest other compounds or analytical errors. Most results for both TOX and TRIS2CH have been near method detection (MDL) or quantitation limits (LOQ).
    - Analytical results indicate a general decline in TOX and TOC from 1990 to 1993 then a leveling off near the LOQs for these indicators. Since 1996 all replicate averages have been below LOQ for these indicators.
    - Nitrate and tritium originate from the B Pond System (maximum NO_3 = 22,500 ug/L in well 699-41-40 in Jan. 1990; maximum tritium = 232,000 pCi/L in same well in Dec. 1989—p.22).
    - I-129 (highest = 4.6 pCi/L) and As (below DWS) have occurred above detection/background in the western portion of the B Pond network, but the source is problematic (origin in 200 East?).
    - Metals and other constituents above DWS or MDLs, but not attributed to facility operation.
        - Fe, Mn, Cr, are elevated due to well construction or oxidizing conditions in the aquifer (dissolved Mn).
        - Several organic compounds detected sporadically are related to lab contamination and "TIC" occurrences.
    - Vertical differences in concentrations of tritium occur in 4 well pairs, with higher concentrations deeper (except 699-43-41 wells) (p.23).
    - Low-level occurrences of gross alpha (high = 7.5 pCi/L 1993) in well 699-40-40B and gross beta (high = 159 pCi/L 1983), U (high = 12.9 pCi/L 1983), Sr-90 (high= 16.3 pCi/L 1985), Cs-137 (high= 8.68 pCi/L 1984) in well 699-42-42A (non-RCRA well)
    - Conductivity is artificially low in some wells and may be recovering from the effects of dilute discharges

Attachment 15

Summary

- Detection monitoring of contamination-indicator parameters and follow-on comprehensive assessment analyses since 1988 have revealed no hazardous waste components in groundwater attributable to the B Pond System. Parameters (TOX/TOC) that placed the facility into assessment in 1990 have historically been near or below LOQs, except for the initial occurrence.
- Soil contamination discovered thus far is minimal—further exploration of the main pond, planned for 1999, will help confirm or refute this assertion.
- Tritium, nitrate(below DWS), gross alpha, beta are attributable to B Pond (low levels of As (below DWS) and I-129 are problematic.
- Conceptual model: Most potential for contamination is below ditches/upper portion of the vadose zone (nonconservative species).

Current Status and Recommendations

- Water levels in the network continue to decline—the well network has been and will continue to be revised to accommodate these changes.

- Current well network (filled symbols on p. 24) has been derived to address two potential sources of contamination:
  - Potential contamination entrained in groundwater in transit beneath the facility
  - Potential contamination in the vadose zone beneath the main pond and adjoining B-3-3 Ditch

- Constituents are selected to detect potential contamination species at the site and satisfy regulatory constraints:
  - Site-specific parameters are gross alpha/beta and conductivity
  - Site-originating parameters that are coordinated/deferred to sitewide surveillance are nitrate, As, I-129, and tritium
  - TOC/TOX are currently sought to satisfy regulatory requirements

- Current network uses upgradient/downgradient comparisons; More representative monitoring would apply intrawell comparisons

- New well(s) proposed to retain effectiveness of network: replacement of 699-43-43 and deep aquifer monitoring; new well at the site of the soil boring in the main pond (p. 24).

Attachment 15

References

Barnett, D. B., 1998a, Interim Change Notice to Interim Status Groundwater Monitoring Plan for the 216-B-3 Pond, ICN-WHC-SD-EN-AP-013.1 R1, Pacific Northwest National Laboratory, Richland, Washington.

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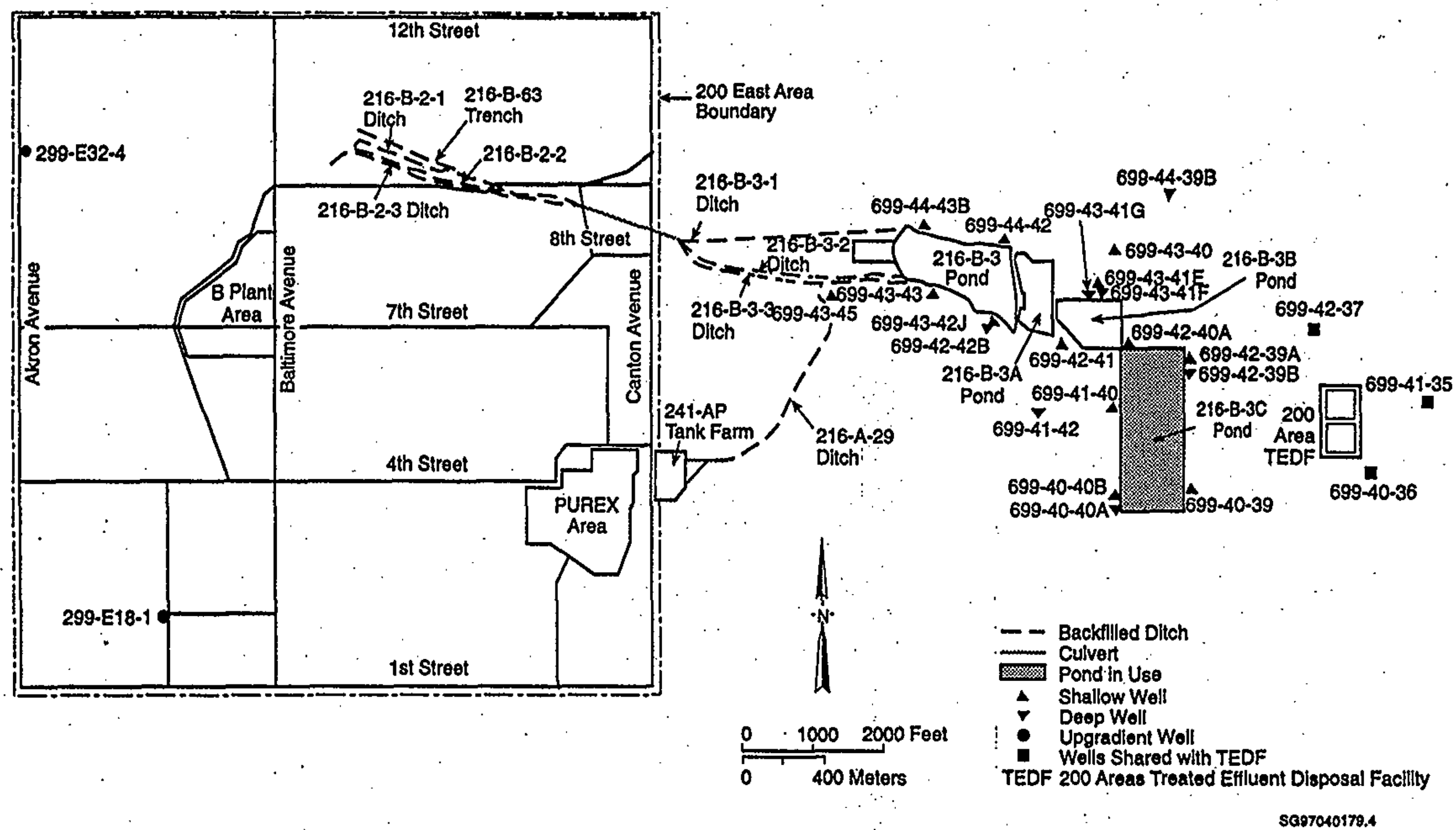
Sweeney, M. D., 1995, Interim Status Groundwater Monitoring Plan for the 216-B-3 Pond, WHC-SD-EN-AP-013, Westinghouse Hanford Company, Richland, Washington.



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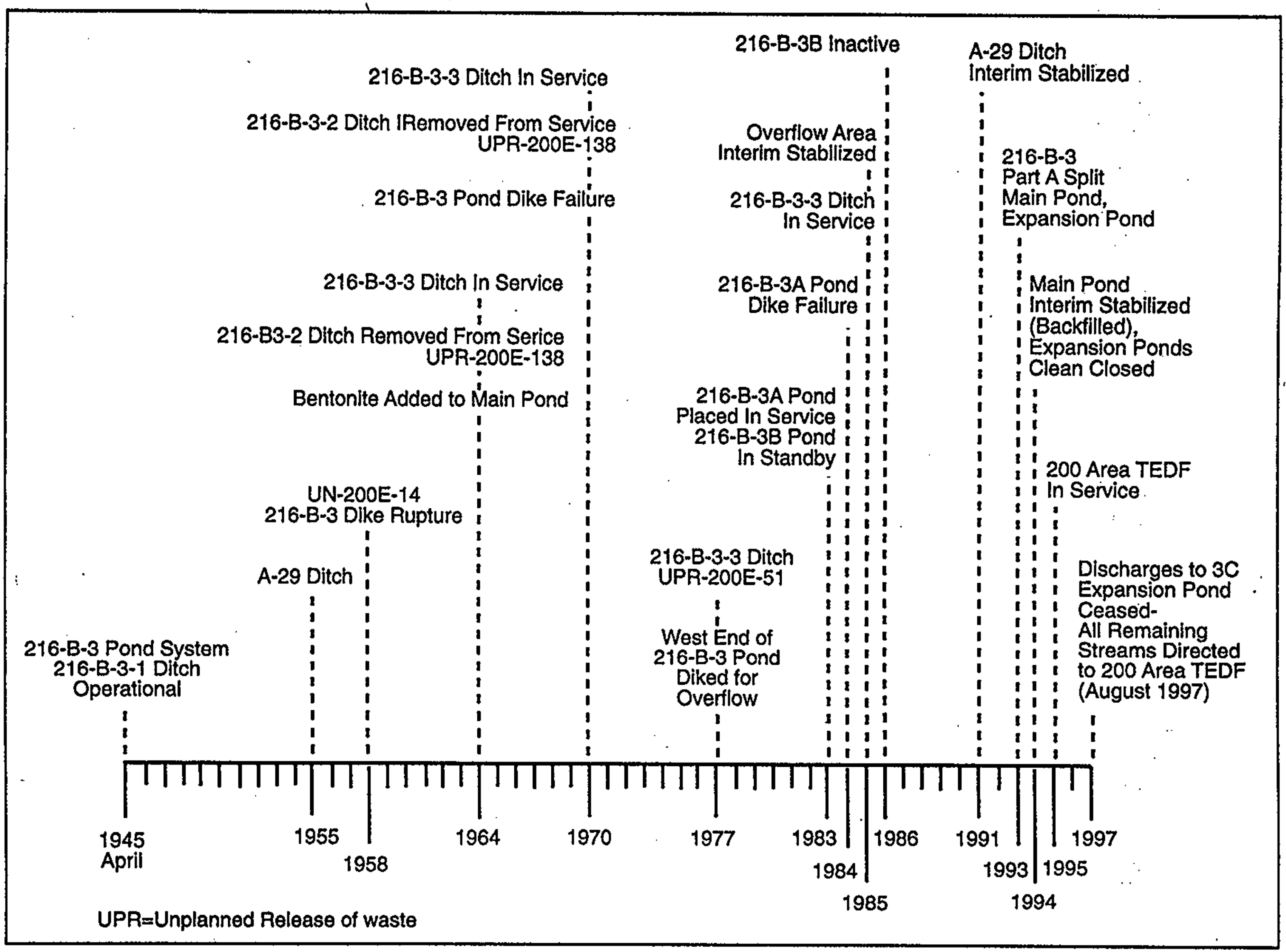

Timeline of Significant Events of the B Pond System Operation

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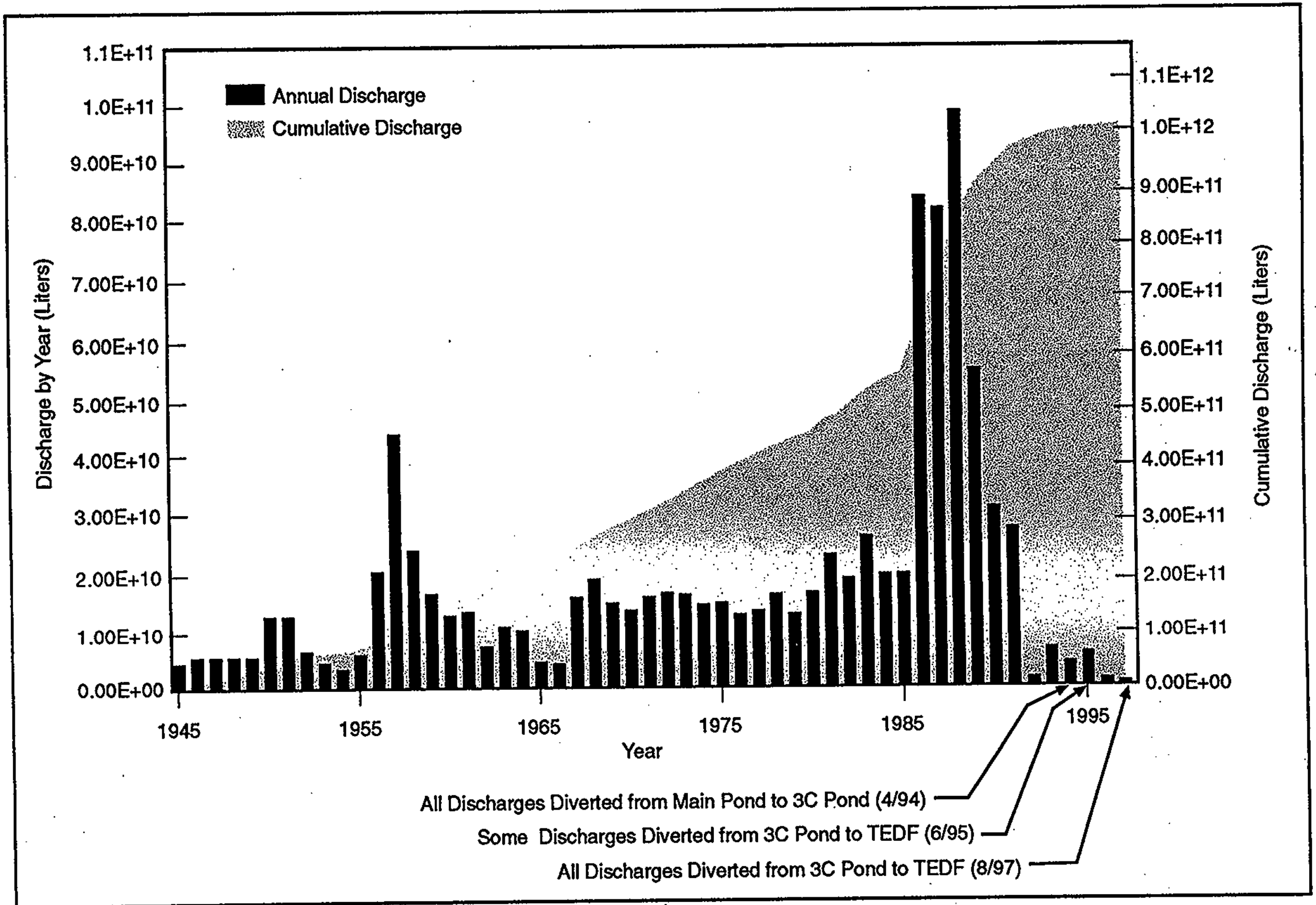
Attachment 15



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Discharge History and Recent Changes in Disposal Sites at the B Pond System

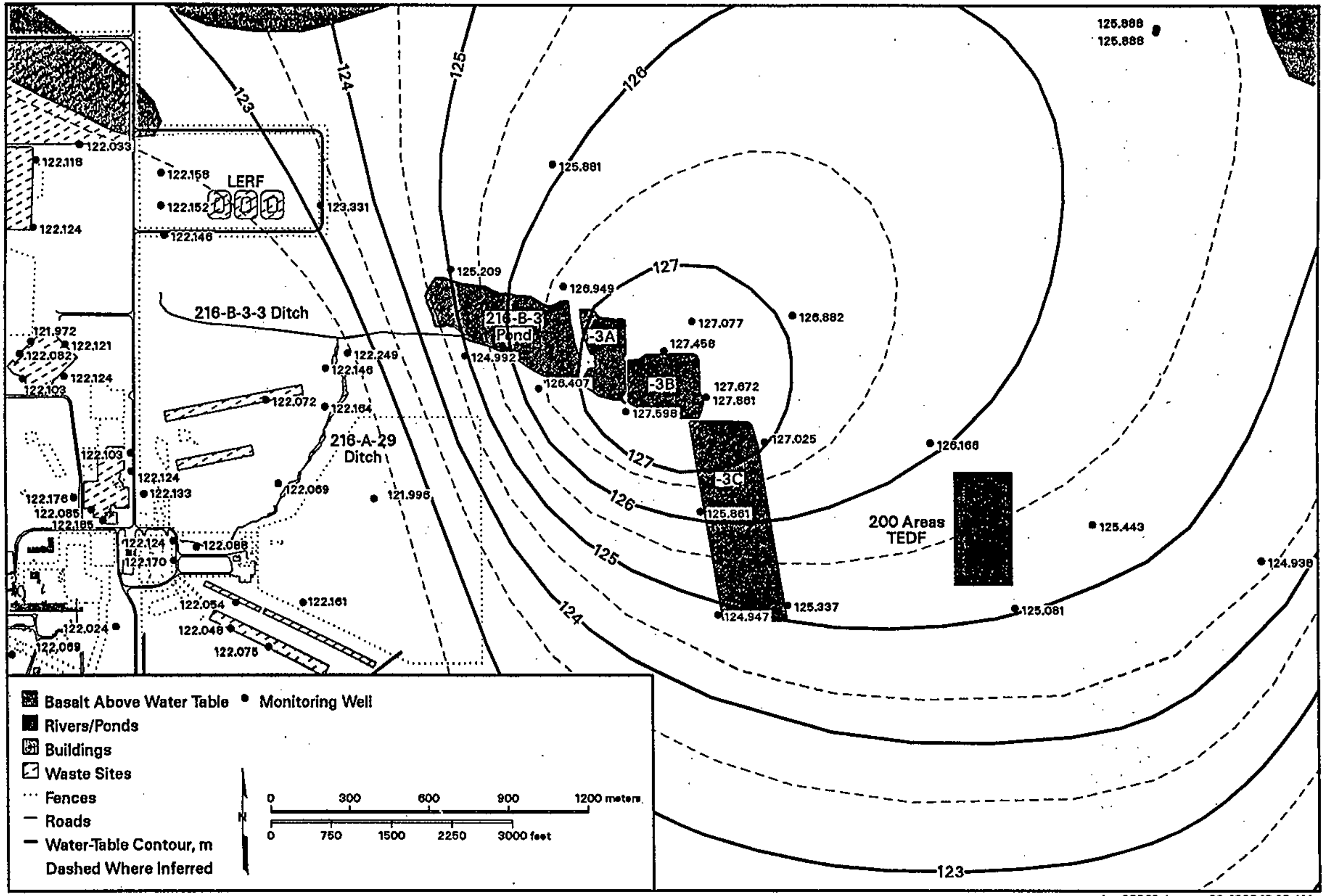
Attachment 15

List of Known and Potential Nonradiological Constituents Discharged to the B Pond System from the PUREX and B Plant Facilities (adapted from DOE-RL 1993b)

Known	Potential	
Aluminum nitrate nonahydrate	Acetic acid	Mercuric nitrate
Ammonium fluoride	Acetone	Nickel ferrocyanide
Ammonium nitrate	Aluminum	Nickel nitrate
Cadmium nitrate	Aluminum nitrate (mono basic)	Periodic acid
Ferrous sulfamate	Ammonia	Phosphoric acid
Hydrazine	Ammonium carbonate	Potassium fluoride
Hydroxylamine nitrate	Ammonium sulfite	Oxalic acid
Nitric acid	Ammonium silcofluoride	Phosphotungstic acid
Potassium permanganate	Boric acid	Shell E-2342 (Naphthalene/paraffins)
Potassium hydroxide	Calcium chloride	Silver Nitrate
Sodium carbonate	Ceric nitrate	Sodium bisulfate
Sodium nitrate	Cesium chloride	Tartaric acid
Sodium hydroxide	Chromate	Tributyl phosphate
Sodium nitrite	Citric acid	Sodium acetate
Sulfuric acid	Dibutyl butyl phosphonate	Sodium bismuthate
	DOW Anti-Foam B* (silicon emulsion)	Sodium dichromate
	Di(2-ethylhexyl)phosphoric acid	Sodium ferrocyanide
	Ethylenediaminetetraacetic acid	Sodium persulfate
	Ferric nitrate	Sodium gluconate
	Ferrous sulfate	Sodium fluoride
	Formaldehyde	Sodium thiosulfate
	Hydrochloric acid	Soltrol-170* (paraffins)
	Hydrogen fluoride	Sugar
	Hydrogen peroxide	Tri-n-dodecylamine
	Hydroxyacetic acid	Trichloroethane
	Hydroxyethyl Ethylenediaminetetraacetic acid	Trisodium nitrilo triacetate
	Hyflo-super-cel* (contains silica)	Strontium fluoride
	Kerosene	Tetrasodium Ethylenediaminetetraacetic acid
	Lanthanum nitrate	Trisodium hydroxyethylenthylene-diaminetriacetic acid
	Lanthanum-neodymium nitrate	Zirconyl nitrate
	Lead nitrate	

Inventory of Radiological Constituents Discharged to the B Pond System, Decayed to 1988 Levels (after DOE-RL 1993b)

Radionuclide	Inventory (curies)
Total alpha	$< 1.6 \times 10^{1}$
Total beta	$<3.93 \times 10^{2}$
Tritium	8.29×10^{2}
Ruthenium-106	$<1.34 \times 10^{-4}$
Promethium-147	<1.03
Plutonium-239	$<5.52 \times 10^{-1}$
Strontium-90	$<1.03 \times 10^{2}$
Cesium-137	$<9.49 \times 10^{1}$
Uranium	<2.07
Americium-241	<3.52



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Potentiometric Map of the B Pond Area for June 1997

Attachment 15

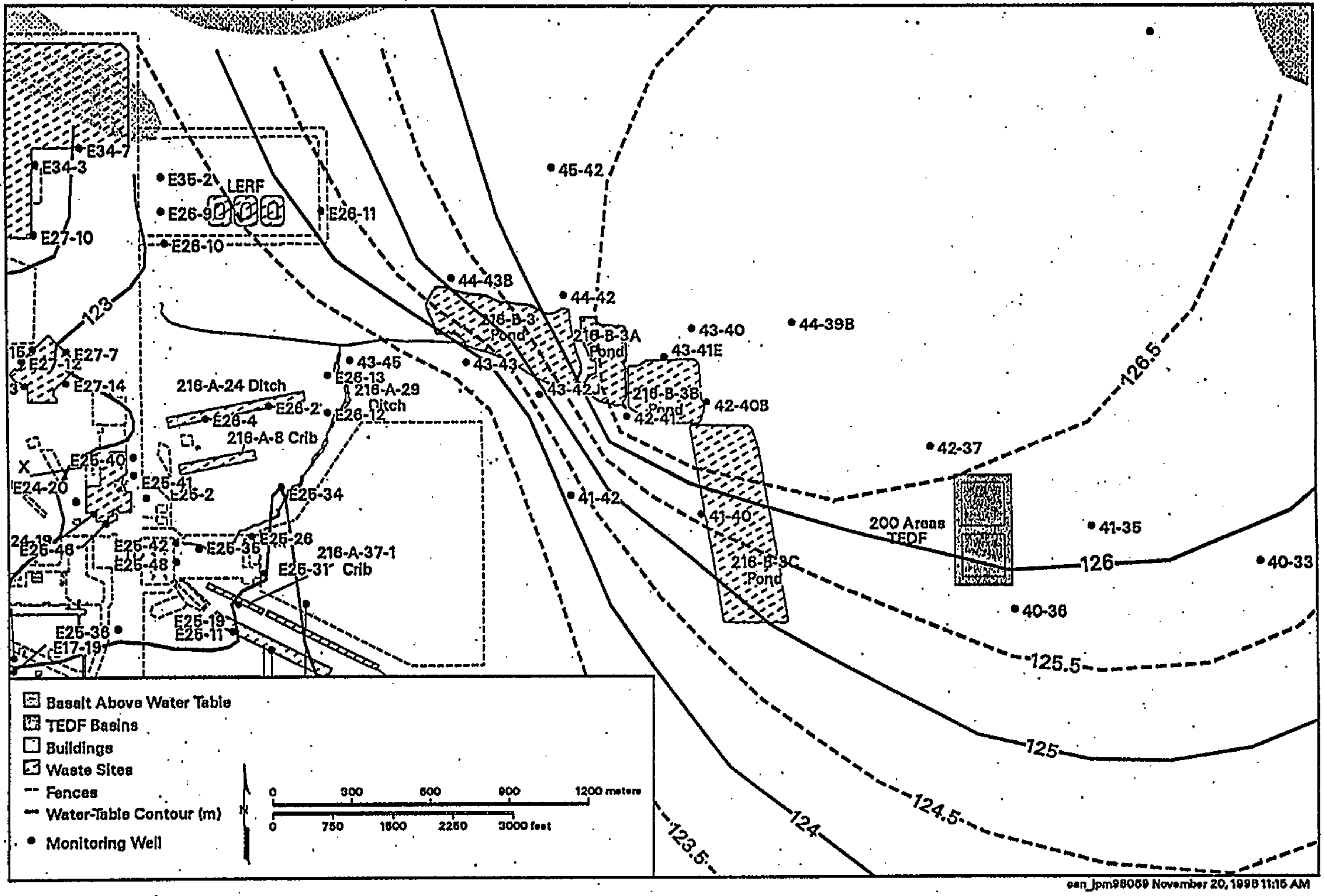
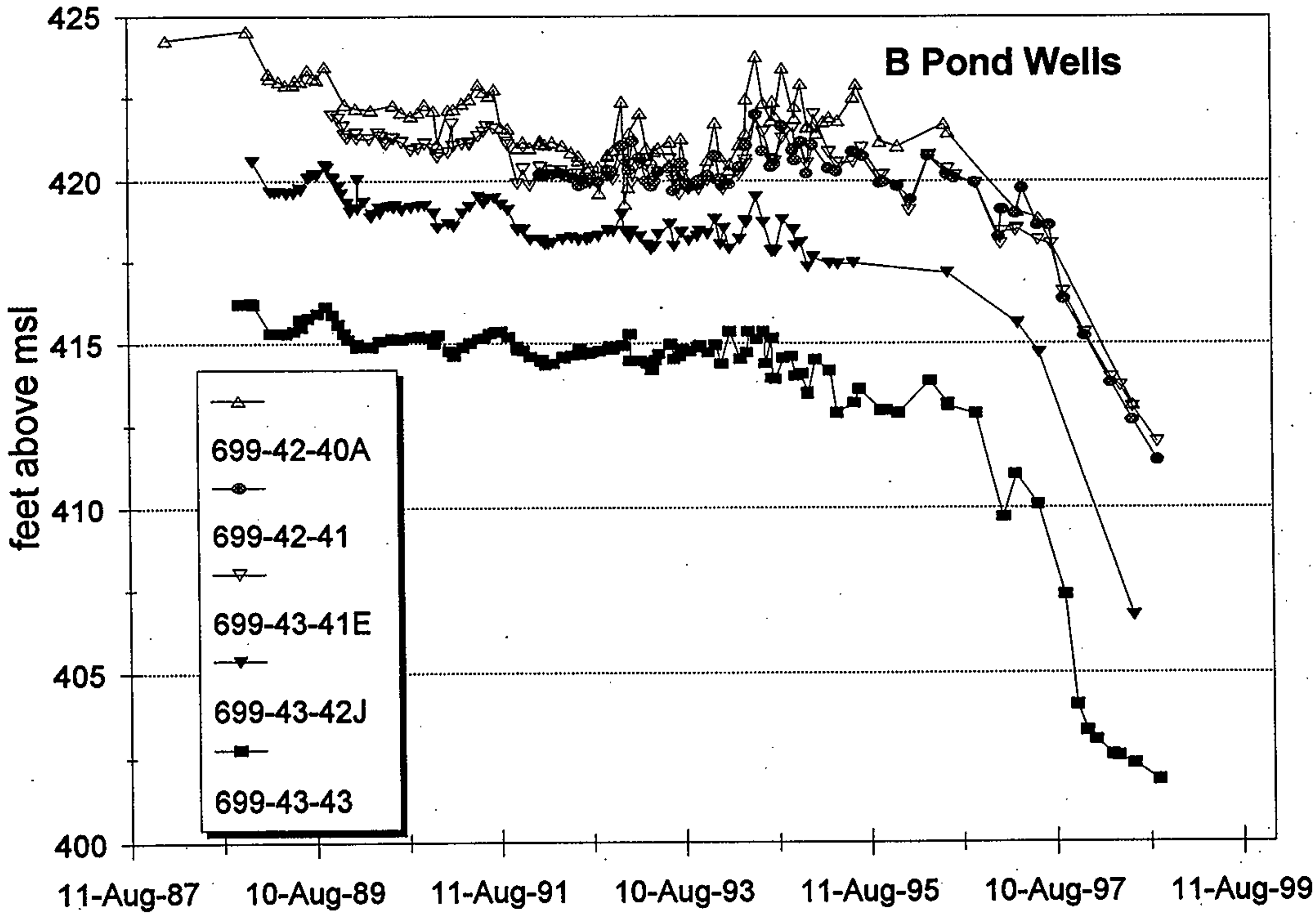


Figure 3.2. Water Table Map for the B Pond Area, June 1998.



Attachment 15

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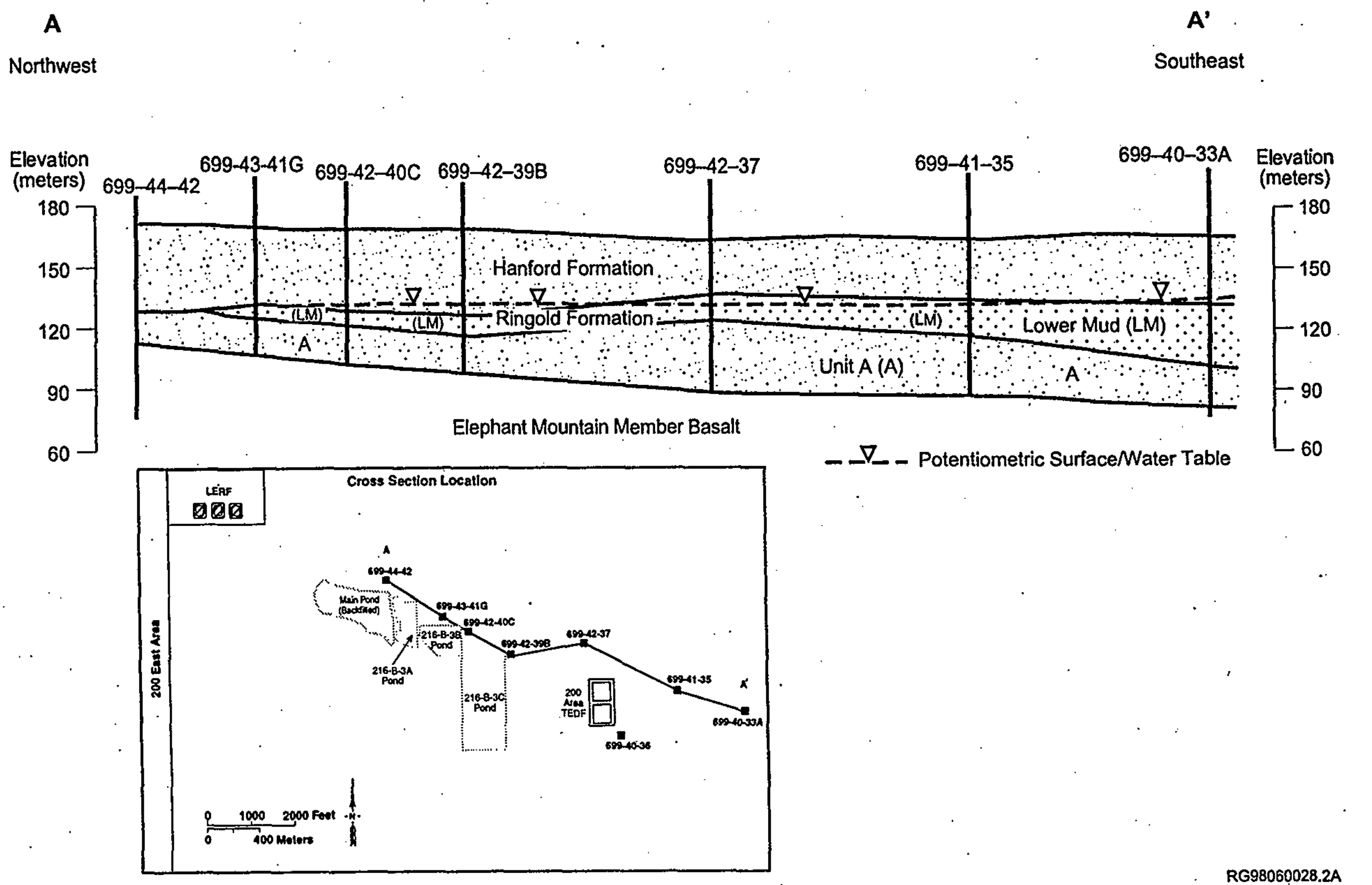
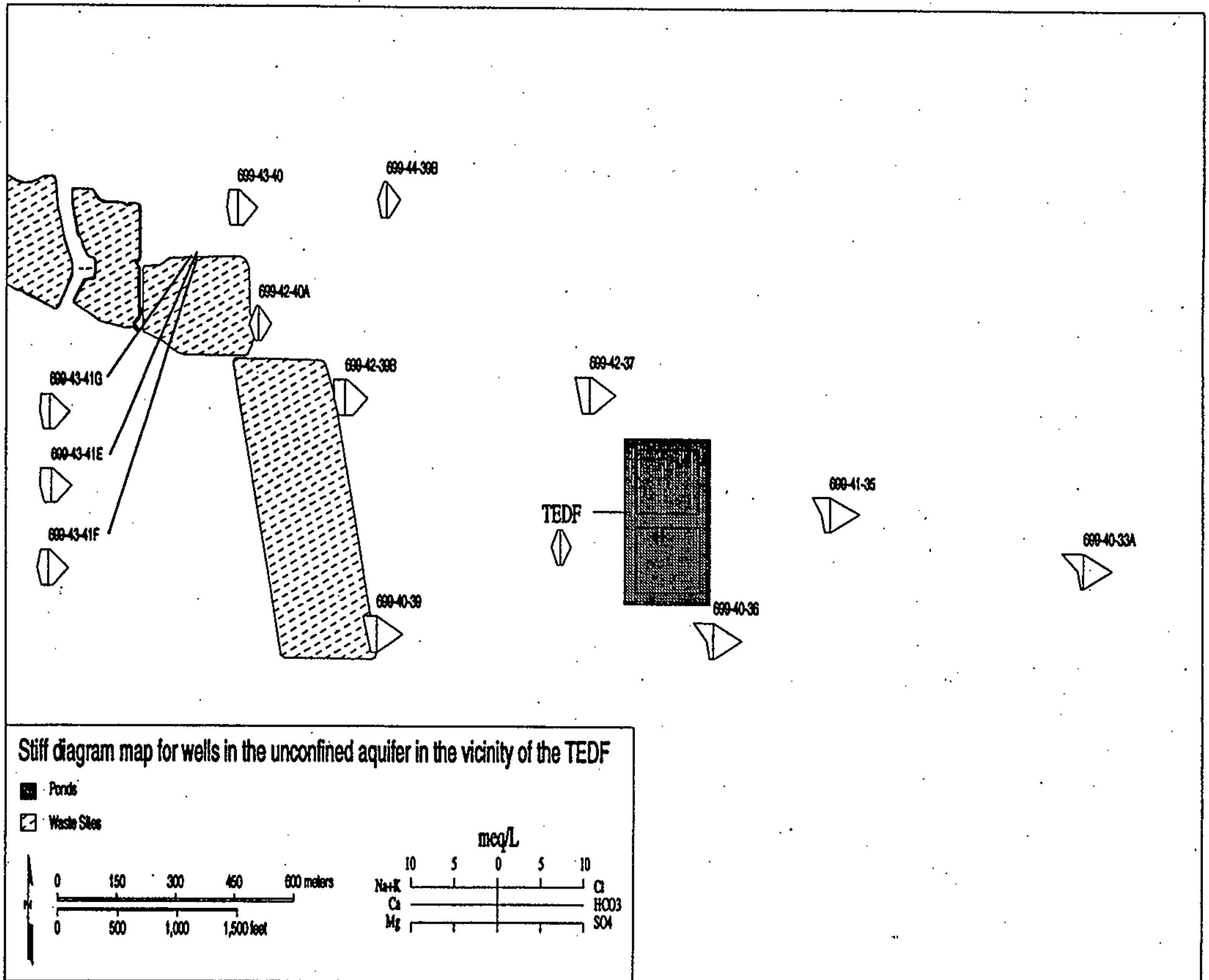


Schematic Cross Section of Suprabasalt Sediments in the TEDF/B Pond Area

Attachment 15

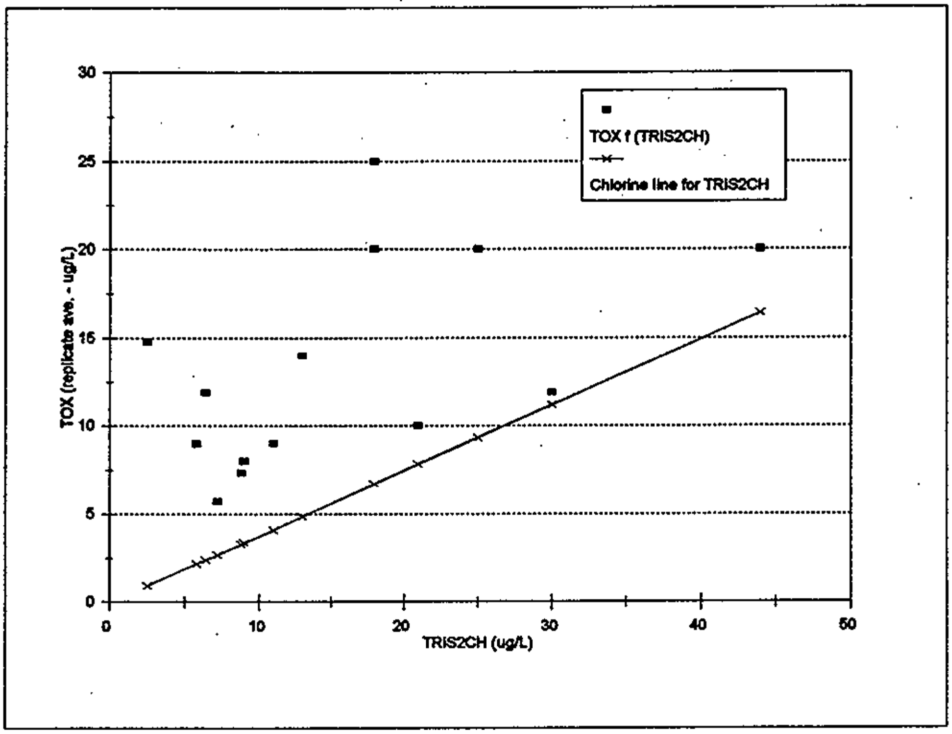


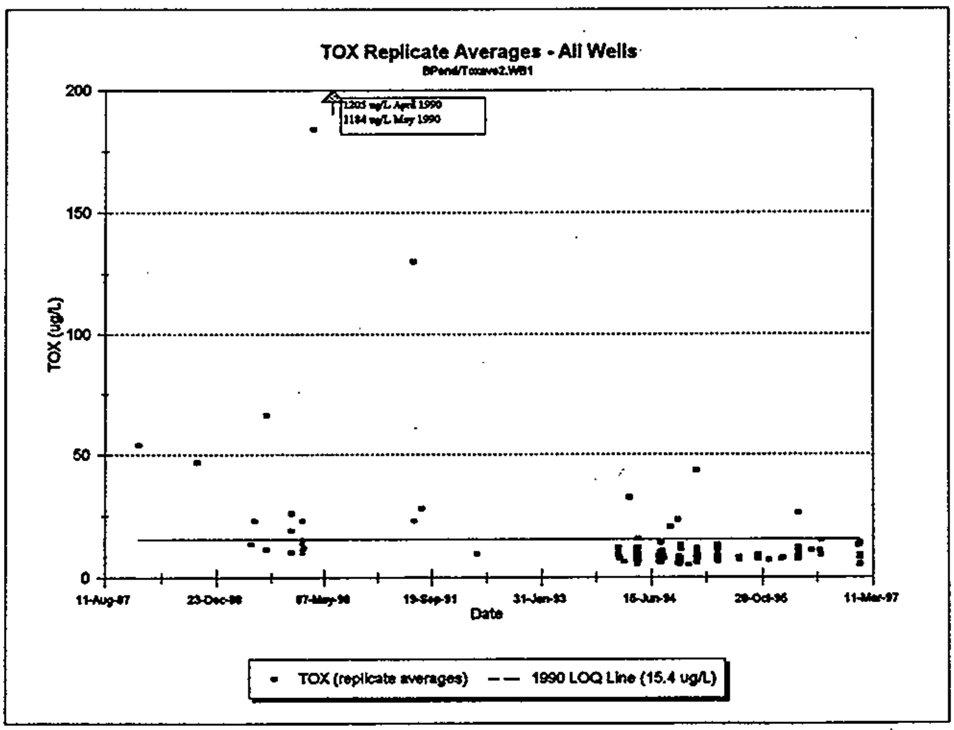
Stiff Diagrams for Wells in the Unconfined Aquifer in the Vicinity of the TEDF

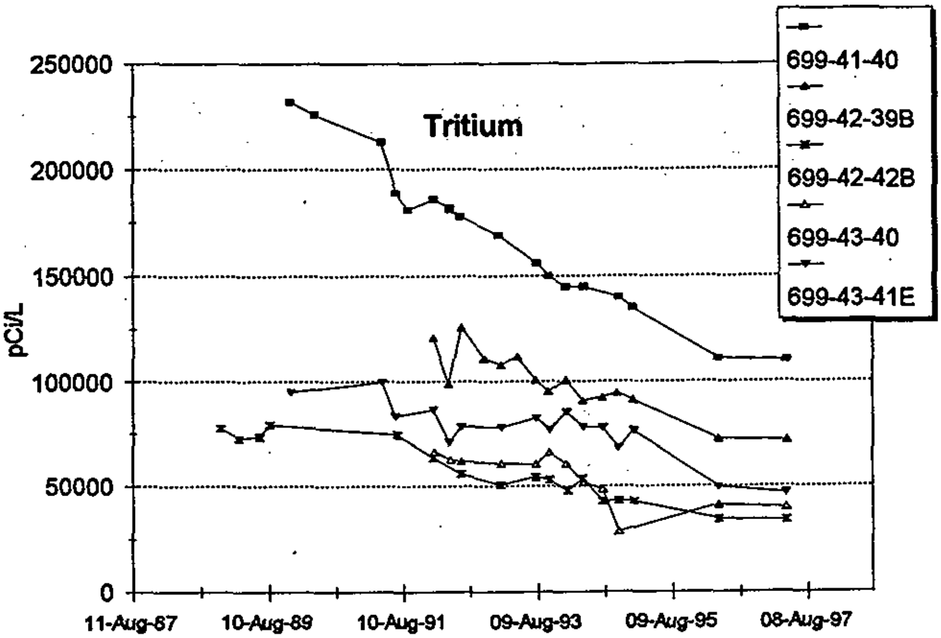
Attachment 15

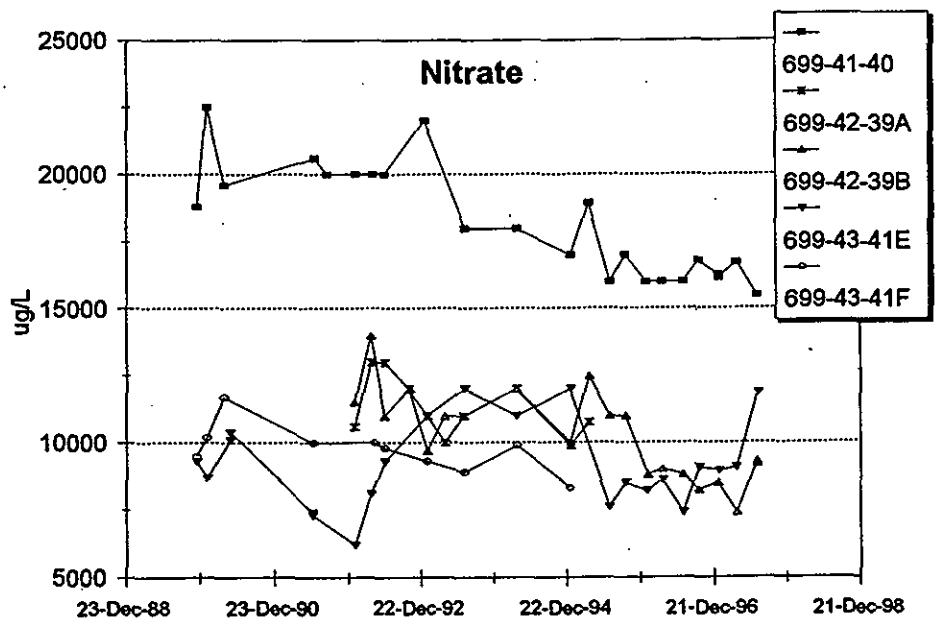
Table 4.5-2. 216-B-3 Pond, Chemical Constituent List.

Contamination indicator parameters		
pH Specific conductance	Total organic carbon Total organic halogens	
Groundwater quality parameters		
Chloride Iron	Manganese Phenols	Sodium Sulfate
Drinking water parameters		
2,4-D 2,4,5-TP Arsenic Barium Chromium Coliform bacteria Endrin	Fluoride Gross alpha Gross beta Lead Lindane Mercury Methoxychlor	Nitrate Radium Selenium Silver Silvex cadmium Toxaphene Turbidity
Site-specific parameters		
Ammonium	Hydrazine	Tritium
Assessment monitoring parameters		
Anions Herbicides Pesticides	Polychlorinated biphenyls Volatile, semi-volatile organic compounds	

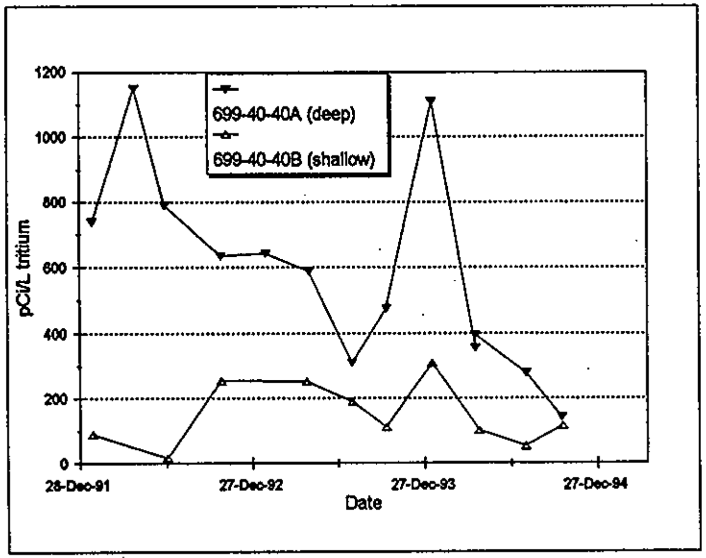

TOX f (TRIS2CH)
Chlorine line for TRIS2CH
TOX (replicate ave. - ug/L)
TRIS2CH (ug/L)
0
5
10
15
20
25
30
0
10
20
30
40
50

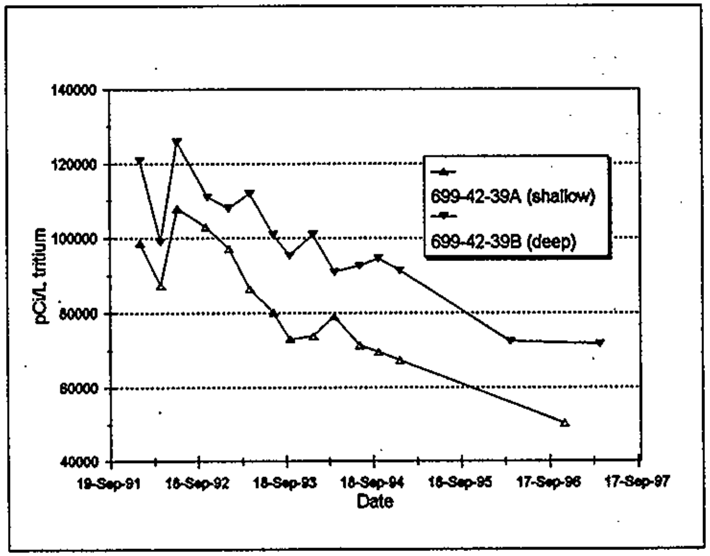

TOX Replicate Averages - All Wells
1205 ug/L April 1990
1184 ug/L May 1990
TOX (ug/L)
0
50
100
150
200
Date
11-Aug-87
23-Dec-88
07-May-90
19-Sep-91
31-Jan-93
15-Jun-94
28-Oct-95
11-Mar-97
TOX (replicate averages)
1990 LOQ Line (15.4 ug/L)

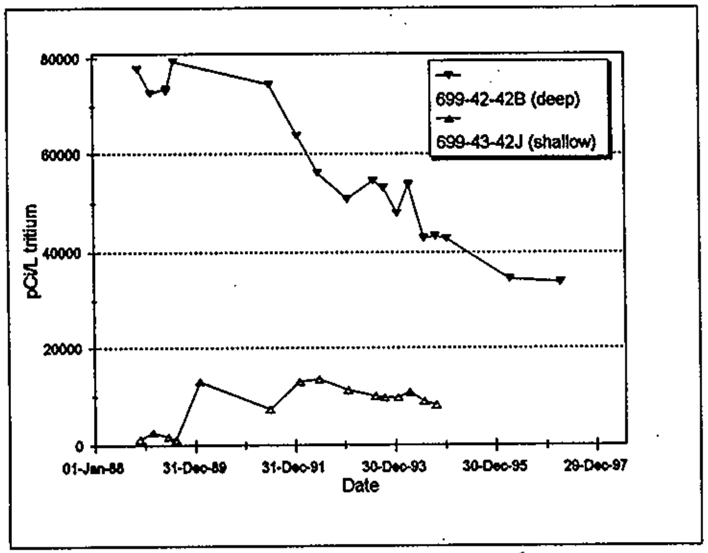

Tritium
pCi/L
250000
200000
150000
100000
50000
0
11-Aug-87
10-Aug-89
10-Aug-91
09-Aug-93
09-Aug-95
08-Aug-97
699-41-40
699-42-39B
699-42-42B
699-43-40
699-43-41E

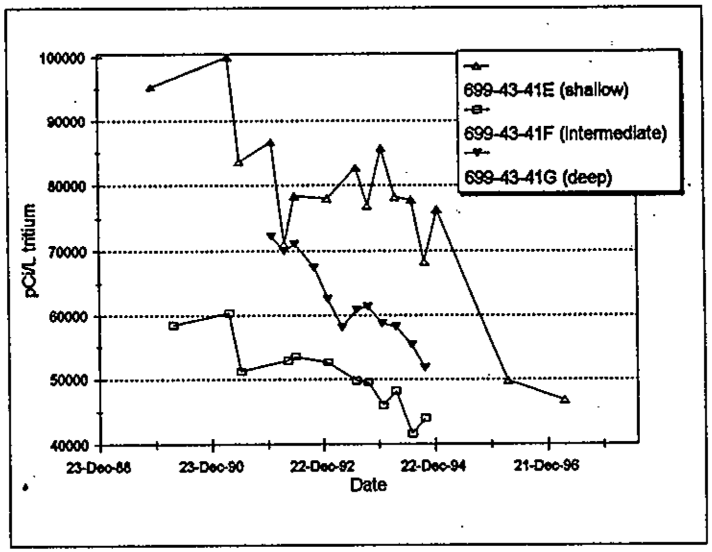

Nitrate
ug/L
25000
20000
15000
10000
5000
23-Dec-88
23-Dec-90
22-Dec-92
22-Dec-94
21-Dec-96
21-Dec-98
699-41-40
699-42-39A
699-42-39B
699-43-41E
699-43-41F

hitrit.wb1/B









Attachment 15

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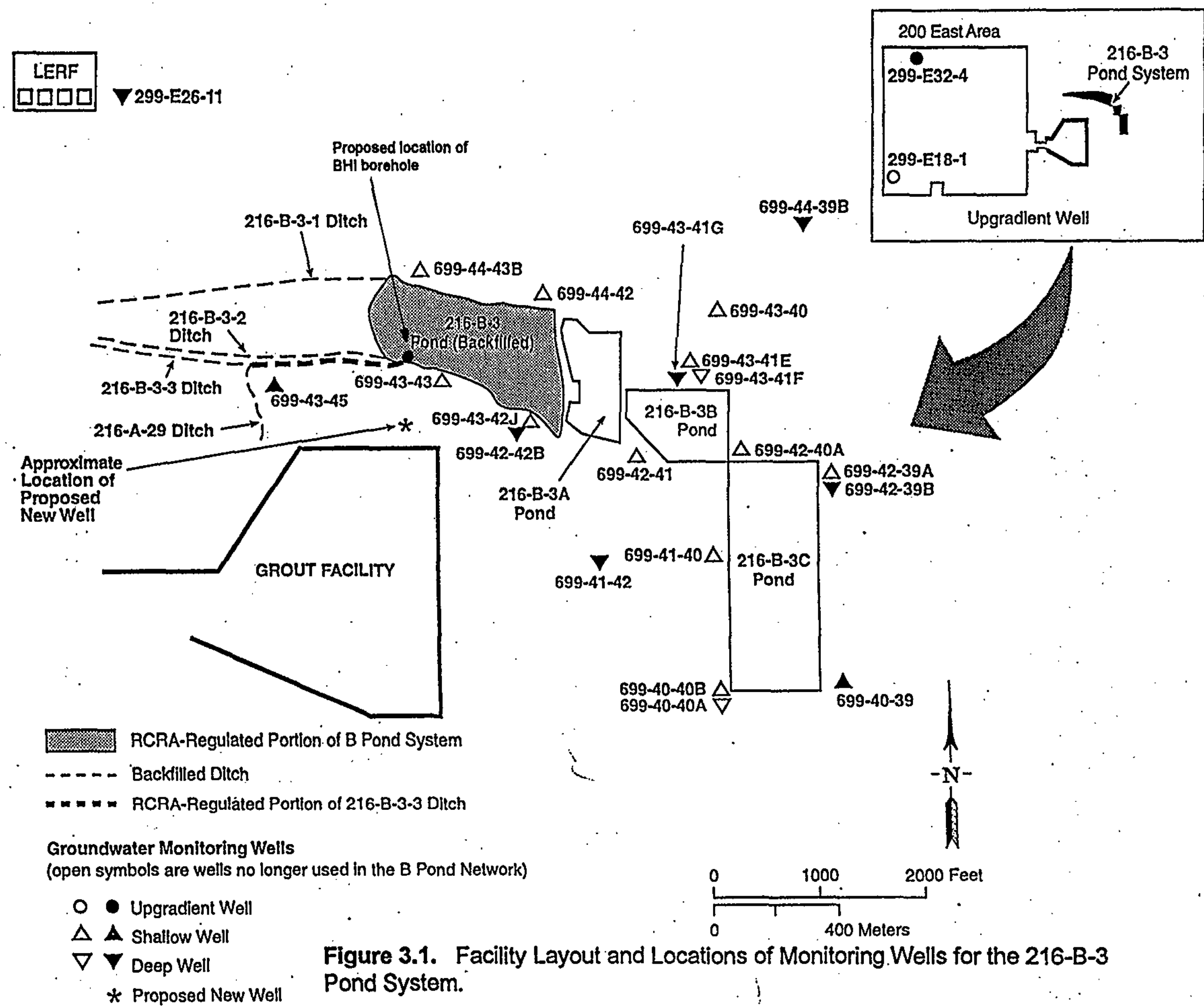

Figure 3.1. Facility Layout and Locations of Monitoring Wells for the 216-B-3 Pond System.

Hanford Barrier Performance Monitoring and Testing

Past Workscope		Workscope Considerations for FY 99	
Tasks	**Subtasks**	**Minimal Subtasks[a]**	**Estimated Cost**
Biointrusion	**Plant Intrusion** • Root Tubes **Animal Intrusion** • Animal Use/Borrowing Survey	Annual Animal Use/Burrowing Survey[1]	2 K
Vegetation	**Plant Dynamics and Physiology** • % Cover/Survivorship • Shrub Height/Size • Leaf Area Index • Gas Exchange • Root Distribution/Density • Reproduction • Species List	Annual Plant Survey[3]	5 K
Stability	**Settlement Gauges** **Surface Topography** **RipRap Side Slope Creep Gauges**	Annual Stability Survey[2]	5 K
Water Balance	**Silt Loam Water Content** • Vertical NeutronTubes (Θ) • Heat Dissipation Units (Ψ) • Time Domain Reflectometry Probe (Θ) • Precipitation	TDR Installation, Maintenance, Automated Data Logging, Data Reduction and Interpretation[5]	35 K
	Drainage • Above Asphalt - Tipping Buckets (D) - Dosing Siphons (D) - Pressure Transducers (D) - Horizontal Neutron Tubes (Θ) • Under Asphalt - Lysimeters (D) - Horizontal Neutron Tubes (Θ)	Drainage Measurement System Calibration, Maintenance, Automated Data Logging, Data Reduction and Interpretation[4]	50 K
Erosion	**Wind** • Surface Inflation/Deflation • Pea Gravel Content **Water** • Surface Runoff		
Reporting	**Annual Reports**	Annual Letter Reporting	20 K

[a] Priorities; 1 being the highest

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Attachment 16

OVERVIEW OF 300-FF-2 WASTE SITE DISPOSITIONS

3/17/99
FINAL

Disposition	EM-30 (STO)	EM-40 (RPD)	NE-80 (SPO)	EM-70 (SID) Prt 1	EM-70 (SID) Prt 2	EM-60 (TPD) Prt 1	EM-60 (TPD) Prt 2	EM-30 (WPD)	Totals
Sites Rejected	49	14	48	67	30	40	15	6	269
Sites Closed Out	5	4	9	0	2	4	6	1	31
Sites Proposed for Remedial Action (Focused Feasibility Study and Proposed Plan)	8	13	0	0	3	6	11	7	48
Sites Proposed for Confirmation Sampling (Focused Feasibility Study and Proposed Plan)	4	3	0	0	1	2	4	5	19
Sites Proposed for No Action (Focused Feasibility Study and Proposed Plan)	0	1	0	0	1	0	0		2
Sites for D&D	1	0	0	0	1	1	15	1	19
Sites Regulated Under Other Regulatory Authorities	2	0	4	1	9	12	0	1	29
Pending Sites	0	0	0	0	0	0	0	0	0
Total Sites Dispositioned	69	35	61	68	47	65	51	21	417

Remedial Action + Confirmation Sampling + No Action = 69
Rejected + Closed Out + D&D + Other Reg. Authorities + Pending = 348

17% carried forward into the 300-FF-2 Focused Feasibility Study & Proposed Plan

Note: The difference between 420 in the 300-FF-2 Detailed Work Plan and 417 as shown above is partly due to five sites that were listed as unassigned. Of these, four were not dispositioned because they have not been processed through the programmatic responsibility assignment task. One of these sites and 1 new site assigned to EM-30 (STO) were dispositioned. 420 - 5 + 2 = 417

Attachment 17

SUMMARY OF 300-FF-2 OPERABLE UNIT WASTE SITE DISPOSITIONS

3/17/99
FINAL

Number of Sites	Disposition
269	Sites Rejected
31	Sites Closed Out
48	Sites Proposed for Remedial Action (Focused Feasibility Study and Proposed Plan)
19	Sites Proposed for Confirmation Sampling (Focused Feasibility Study and Proposed Plan)
19	Sites for D&D
29	Sites Regulated Under Other Regulatory Authorities
2	Sites Proposed for No Action (Focused Feasibility Study and Proposed Plan)
0	Pending Sites
417	Total Sites Dispositioned

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
SITES REJECTED							
300-59	305 Building Steam Condensate, Miscellaneous Stream #417	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-67	Steam Condensate from 300 Area Main Steam Header, Miscellaneous Stream #414	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate. Near Radiologically Contaminated Process Sewer Access Port	SID
300-68	305 Building Steam Condensate, Miscellaneous Stream #451, Pit U23	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-69	305 Building Steam Condensate, Miscellaneous Stream #415	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-70	305 Building Steam Condensate, Miscellaneous Stream #416	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-71	306E Building HVAC Condensate, Miscellaneous Stream #454	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	HVAC Condensate	SID
300-86	300 Area South Parking Lot Stormwater Runoff, Miscellaneous Stream #524	Depression/Pit (nonspecific)	Active	Accepted	Reclassify as Rejected	Stormwater Runoff	SID
300-102	328 Building Steam Condensate, Miscellaneous Stream #353	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-116	3506A Building Steam Condensate, Miscellaneous Stream #381	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-117	3506A Building Steam Condensate, Miscellaneous Stream #382	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-118	3621D Building Steam Condensate, Miscellaneous Stream #700	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-119	3621D Compressed Air System Condensate, Miscellaneous Stream #401	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Compressed Air System Condensate	SID
300-120	3621D Building Diesel Generator Cooling System Condensate, Miscellaneous Stream #402	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Cooling System Condensate	SID
300-121	3621D Building Stormwater Runoff, Miscellaneous Stream #403, Injection Well #26	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-122	366 Building Fuel Oil Bunker Loading Station Steam Trap 3G-Yard-LPD-TRP-53,57,58, Miscellaneous Stream #344	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-124	366 Building Fuel Oil Bunker Steam Trap 3G-Yard-LPD-TRP-054, Miscellaneous Stream #653	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-125	3702 Building Steam Condensate, Miscellaneous Stream #346	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-126	3703 Building Steam Condensate, Miscellaneous Stream #431	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-127	3705 Building Stormwater Runoff, Miscellaneous Stream #410	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-128	3705 Building Stormwater Runoff, Miscellaneous Stream #411	French Drain	Inactive	Rejected	Rejected	Stormwater Runoff	SID
300-129	3705 Building Stormwater Runoff, Miscellaneous Stream #412	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-130	3705 Building Stormwater Runoff, Miscellaneous Stream #413	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-150	3706 Building Steam Condensate, Miscellaneous Stream #430	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-151	3707B Building Steam Condensate, Miscellaneous Stream #327	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-152	3707B Building Steam Condensate, Miscellaneous Stream #326, U57	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-153	3707B Building Steam Condensate, Miscellaneous Stream #328	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-154	3707B Building Steam Condensate, Miscellaneous Stream #325	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-155	3707C Building Steam Condensate, Miscellaneous Stream #179, Injection Well #24	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-156	3707C Building Steam Condensate, Miscellaneous Stream #178, Injection Well #23	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate. Near Manhole Labeled "Caution, Radioactive Material"	SID
300-157	3707C Building Steam Condensate, Miscellaneous Stream #337	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-158	3707C Building Steam Condensate, Miscellaneous Stream #336, F.D. #31	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID

WIDS Site Code(s)	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
300-159	3707C Building Steam Condensate, Miscellaneous Steam #335	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-160	3707D Building Steam Condensate, Miscellaneous Stream #443	Injection/Reverse Well	Active	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-161	3707D Building Stormwater Runoff, Miscellaneous Stream #441	Injection/Reverse Well	Active	Accepted	Reclassify as Rejected	Stormwater Runoff. Near Support Poles Posted for Underground Radioactive Material.	SID
300-162	3707D Building Stormwater Runoff, Miscellaneous Stream #442	Injection/Reverse Well	Active	Accepted	Reclassify as Rejected	Stormwater Runoff. Near Support Poles Posted for Underground Radioactive Material. Also possible runoff from a contaminated roof.	SID
300-164	3709 Building Steam Condensate, Miscellaneous Stream #338, F.D. #3	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-165	3709A Building Condensate, Miscellaneous Stream #347	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Condensate from Air Compressor	SID
300-166	3709A Building Steam Condensate, Miscellaneous Stream #355, Drip Station U-40	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-167	3711 Building Steam Condensate, Miscellaneous Stream #343	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-168	3711 Building Steam Condensate, Miscellaneous Stream #433	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-171	3713 Building Steam Condensate and Stormwater Runoff, Miscellaneous Stream #333, F.D. #7	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater Runoff only at this time	SID
300-172	3713 Building Steam Condensate, Miscellaneous Stream #435	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-173	3713 Building Steam Condensate, Miscellaneous Stream #512	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-174	3713 Building Stormwater Runoff and Steam Condensate, Miscellaneous Stream #544	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater Runoff and Steam Condensate	SID
300-176	3715 Building Steam Condensate, Miscellaneous Stream #678	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-177	3717 Building Steam Condensate, Miscellaneous Stream #330	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-178	3717 Building Steam Condensate, Miscellaneous Stream #329	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-179	3717 Building Steam Condensate, Miscellaneous Stream #324	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-180	3717 Building Stormwater Runoff, Miscellaneous Stream #545	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater Runoff	SID
300-181	3717 Building Steam Condensate, Miscellaneous Stream #180	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-182	3717B Building Steam Condensate, Miscellaneous Stream #323	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-183	3718 Building Steam Condensate, Miscellaneous Stream #340, F.D. #40	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-185	3722 Building Steam Condensate, Miscellaneous Stream #436, Injection Well #6	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-192	3732 Building Steam Condensate, Miscellaneous Stream #349	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Assoc. with WIDS sites 300-48 and 300-245.	SID
300-193	3732 Building Steam Condensate, Miscellaneous Stream #419, Injection Well #15	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Assoc. with WIDS sites 300-48 and 300-245.	SID
300-194	3734 Building Steam Condensate, Miscellaneous Stream #334, F.D. #8	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-195	3734A Building Steam Condensate, Miscellaneous Stream #519	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-202	3765 Building HVAC Condensate, Miscellaneous Stream #345	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	HVAC Condensate	SID
300-204	3790 Building Stormwater Runoff, Miscellaneous Stream #378, F.D. #19, Injection Well #19	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-205	3790 Building Stormwater Runoff, Miscellaneous Stream #377, F.D. #18, Injection Well #18	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-206	3790 Building Stormwater Runoff, Miscellaneous Stream #373	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-207	3790 Building Stormwater Runoff, Miscellaneous Stream #375, F.D. #16, Injection Well #16	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID

DISPOSITION OF 300-FF-2 OPERABLE UNIT WASTE SITES

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RI Division
300-208	3790 Building Stormwater Runoff, Miscellaneous Stream #376, F.D. #17, Injection Well #17	French Drain	Active	Rejected	Rejected	Stormwater Runoff	SID
300-209	3790 Building Stormwater Runoff, Miscellaneous Stream #374	French Drain	Inactive	Rejected	Rejected	Stormwater Runoff	SID
300-210	3790 Building Stormwater Runoff, Miscellaneous Stream #514	French Drain	Inactive	Rejected	Rejected	Stormwater Runoff	SID
300-211	382 Building Steam Condensate, Miscellaneous Stream #429	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-213	West High Tank (Water Tower) Overflow and Steam Condensate, Miscellaneous Stream #332	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	SID
300-26	300-26, Powerhouse Fuel Oil Spill, 384 Powerhouse #6 Fuel Oil Spill	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Site cleaned up	SID2
300-30	300-30, 3705 Photography Building	Process Unit/Plant	Active	Accepted	Reclassify as Rejected	Building w/ no evidence of releases	SID2
300-36	300-36, 384 Power House Oil Release to French Drain	Unplanned Release	Inactive	Rejected	Rejected	Site was cleaned up at time of spill.	SID2
300-56	300-56, 306-E 90-Day Waste Accumulation Area	Storage Pad (<90 day)	Active	Accepted	Reclassify as Rejected	<90 day storage area	SID2
300-215	300-215, 300 Area South	Dumping Area	Inactive	Accepted	Reclassify as Rejected	Misc. nonhazardous debris	SID2
300-217	300-217, 300 Area Laydown Yard	Storage	Inactive	Rejected	Rejected	No known releases of wood preservatives.	SID2
300-220	300-220, Gravel Pit #7	Depression/Pit (nonspecific)	Inactive	Rejected	Rejected	Gravel pit	SID2
300 IFBD	300 IFBD, 300 Area Interim Filter Backwash Disposal	Depression/Pit (nonspecific)	Inactive	Accepted	Reclassify as Rejected	Temporary filter backwash disposal site.	SID2
300 PHWSA	300 PHWSA, 300 Area Powerhouse HWSA, 300 Area Powerhouse Hazardous Waste Storage Area	Satellite Accumulation Area	Inactive	Accepted	Reclassify as Rejected	No evidence of spills, no longer in use.	SID2
300 SSS	300 SSS, 300 Area Sanitary Sewer System	Sanitary Sewer	Active	Rejected	Rejected	Sanitary sewage only	SID2
315 RSDF	315 RSDF, 315 Retired Sanitary Drain Field	Drain/Tile Field	Inactive	Accepted	Reclassify as Rejected	Sanitary sewage only	SID2
3713 PSHWSA	3713 PSHWSA, 3713 Paint Shop Hazardous Waste Satellite Area	Satellite Accumulation Area	Inactive	Accepted	Reclassify as Rejected	No evidence of spills	SID2
3713 SSHWSA	3713 SSHWSA, 3713 Sign Shop Hazardous Waste Satellite Area	Satellite Accumulation Area	Inactive	Accepted	Reclassify as Rejected	No evidence of spills	SID2
3746-D SR	3746-D SR, 3746-D Silver Recovery, 3746 D Silver Recovery Process	Process Unit/Plant	Inactive	Accepted	Reclassify as Rejected	Equipment; no evidence of spills, address with D&D of facility.	SID2
400-7	400-7, 4607 SSST, 4607 Sanitary Sewer Septic Tank, 4607 SS, 4607 Sanitary Sewer	Septic Tank	Active	Accepted	Reclassify as Rejected	Sanitary sewage only	SID2
400-11	400-11, 4607 SSL, 4607 Sanitary Sewer Lagoon, 400 Area Wetlands	Pond	Inactive	Accepted	Reclassify as Rejected	Sanitary sewage only	SID2
400-12	400-12, 4607 STF, 4607 Sanitary Tile Field, 4608A Sanitary Sewer Leaching Field, 4608A Leaching Field	Drain/Tile Field	Inactive	Accepted	Reclassify as Rejected	Sanitary sewage only	SID2
400 RST	400 RST, 400 Area Retired Septic Tanks	Septic Tank	Inactive	Accepted	Reclassify as Rejected	Sanitary sewage only	SID2
400 SS	400 SS, 400 Area Sanitary Sewer, 4608 Sanitary Sewer, 4608 SS	Septic Tank	Inactive	Accepted	Reclassify as Rejected	Sanitary sewage only	SID2
400 STF	400 STF, 400 Area Sanitary Tile Field, 4608 Sanitary Tile Field, 4608 STF	Drain/Tile Field	Inactive	Accepted	Reclassify as Rejected	Sanitary sewage only	SID2
4722-B FD	4722-B FD, 4722-B French Drain	French Drain	Inactive	Accepted	Reclassify as Rejected	Sink drainage if it ever existed	SID2
4722-C FD	4722-C FD, 4722-C French Drain, French Drain South of 4722-C, Miscellaneous Stream #29	French Drain	Active	Accepted	Reclassify as Rejected	seldomly used kitchen sink discharge in the process of being terminated 1/99.	SID2
4722 PSHWSA	4722 PSHWSA, 4722 Paint Shop HWSA, 4722 Paint Shop Hazardous Waste Storage Area, 4722-C Hazardous Waste Storage Area	Storage Pad (<90 day)	Active	Accepted	Reclassify as Rejected	<90 day storage area; no evidence of spills	SID2
600-155	600-155, Dumping Area Upstream of River Mile Marker 35 Identified During RCRA General Inspection #HIRIV-FY96 Item #7	Dumping Area	Inactive	Rejected	Rejected	Misc. nonhazardous debris	SID2
600-244	600-244, Gravel Pit #6	Depression/Pit (nonspecific)	Active	Rejected	Rejected	Gravel pit	SID2
600-245	600-245, Gravel Pit #8	Depression/Pit (nonspecific)	Active	Rejected	Rejected	Gravel pit	SID2

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
600-246	600-246, Gravel Pit #9, Inert/Demolition Waste Landfill (Pit 9)	Burial Ground	Active	Accepted	Rejected	Inert Landfill w/ asphalt	SID2
600-247	600-247, Gravel Pit #10, Inert Landfill (Pit 10)	Burial Ground	Inactive	Accepted	Rejected	Inert Landfill (Closed) w/ asphalt	SID2
600-248	600-248. Gravel Pit #11	Depression/Pit (nonspecific)	Active	Rejected	Rejected	Gravel pit	SID2
600-249	600-249, Debris Within Gravel Pit #6	Dumping Area	Inactive	Accepted	Reclassify as Rejected	Misc. debris, coal flyash, and asphalt	SID2
300-60	303A Building Steam Condensate, Miscellaneous Stream #339, F.D. #26	Injection/Reverse Well	Active	Accepted	Reclassify as Rejected	Steam Condensate	TPD
300-61	303B Building Steam Condensate, Miscellaneous Stream #444, Injection Well #12	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	TPD
300-64	303 F Building Steam Condensate, Miscellaneous Stream #352	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate	TPD
300-72	308 Building Stormwater Runoff, Miscellaneous Stream #404	Injection/Reverse Well	Active	Rejected	Rejected	Building Stormwater Runoff	TPD
300-73	308 Building Stormwater Runoff, Miscellaneous Stream #405	Injection/Reverse Well	Inactive	Rejected	Rejected	Building Stormwater Runoff	TPD
300-74	308 Building Stormwater Runoff, Miscellaneous Stream #406	Injection/Reverse Well	Inactive	Rejected	Rejected	Building Stormwater Runoff	TPD
300-75	309 Building Stormwater Runoff and Chiller Water, Miscellaneous Stream #445, Injection Well #20	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Building Stormwater Runoff and Chiller Water	TPD
300-77	309 Building Stormwater Runoff, Miscellaneous Stream #450	Injection/Reverse Well	Inactive	Rejected	Rejected	Building Stormwater Runoff	TPD
300-78	313 Building Main Header Steam Trap, Miscellaneous Stream #331.	Injection/Reverse Well	Active	Accepted	Reclassify as Rejected	Steam Condensate	TPD
300-79	313 Building Stormwater Runoff, Miscellaneous Stream #457	Injection/Reverse Well	Active	Rejected	Rejected	Building Stormwater Runoff	TPD
300-81	321 Building Steam Condensate, Miscellaneous Stream #370	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site UPR-300-4.	TPD
300-82	321 Building Steam Condensate, Miscellaneous Stream #371	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site UPR-300-4.	TPD
300-83	321 Building Steam Condensate, Miscellaneous Stream #372	Injection/Reverse Well	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site UPR-300-4.	TPD
300-84	321 Building Vent Valve on Water Line, Miscellaneous Stream #348	Valve Pit	Inactive	Accepted	Reclassify as Rejected	Building Vent Valve on Water Line; Associated with WIDS site UPR-300-4.	TPD
300-87	309 Building Stormwater Runoff, Miscellaneous Stream #679	French Drain	Inactive	Rejected	Rejected	Building Stormwater Runoff	TPD
300-92	321 Building Stormwater Runoff, Miscellaneous Stream #680	Injection/Reverse Well	Active	Accepted	Reclassify as Rejected	Building Stormwater Runoff; Associated with WIDS site UPR-300-4.	TPD
300-93	324 Building Stormwater Runoff, Miscellaneous Stream #354	Injection/Reverse Well	Inactive	Rejected	Rejected	Building Stormwater Runoff	TPD
300-94	324 Building Stormwater Runoff, Miscellaneous Stream #711	French Drain	Active	Rejected	Rejected	Building Stormwater Runoff	TPD
300-95	324/336 Buildings Stormwater Runoff and Steam Condensate; Miscellaneous Stream #425	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater Runoff and Steam Condensate	TPD
300-131	3706 Fire Sprinkler System Water, Miscellaneous Stream #515	French Drain	Active	Accepted	Reclassify as Rejected	Fire Sprinkler System Water; Associated with WIDS site 300-46.	TPD
300-132	3706 Building Steam Condensate, Miscellaneous Stream #368	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-133	3706 Building Steam Condensate, Miscellaneous Stream #367, Injection Well #27	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-134	3706 Building Steam Condensate, Miscellaneous Stream #362	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-135	3706 Building Steam Condensate, Miscellaneous Stream #365	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-136	3706 Building Steam Condensate, Miscellaneous Stream #366	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-137	3706 Building Steam Condensate, Miscellaneous Stream #440	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-138	3706 Building Steam Condensate, Miscellaneous Stream #360	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-139	3706 Building Steam Condensate, Miscellaneous Stream #357	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-140	3706 Building Steam Condensate, Miscellaneous Stream #356	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD

DISPOSITION OF 300-FF-2 OPERABLE UNIT WASTE SITES

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
300-141	3706 Building Steam Condensate, Miscellaneous Stream #439, Injection Well #29	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-142	3706 Building Steam Condensate, Miscellaneous Stream #369, Injection Well #30	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-143	3706 Building Steam Condensate, Miscellaneous Stream #361	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-144	3706 Building Steam Condensate, Miscellaneous Stream #358	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-145	3706 Building Steam Condensate, Miscellaneous Stream #438, Injection Well #25	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-146	3706 Building Stormwater Runoff, Miscellaneous Stream #364	French Drain	Active	Accepted	Reclassify as Rejected	Building Stormwater Runoff; Associated with WIDS site 300-46.	TPD
300-147	3706 Building Stormwater Runoff, Miscellaneous Stream #363	French Drain	Active	Accepted	Reclassify as Rejected	Building Stormwater Runoff; Associated with WIDS site 300-46.	TPD
300-148	3706 Building Stormwater Runoff, Miscellaneous Stream #359	French Drain	Active	Accepted	Reclassify as Rejected	Building Stormwater Runoff; Associated with WIDS site 300-46.	TPD
300-149	3706A Building Steam Condensate, Miscellaneous Stream #432, Injection Well #28	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 300-46.	TPD
300-169	3712 Building Steam Condensate, Miscellaneous Stream #351	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 3712 USSA.	TPD
300-170	3712 Building Steam Condensate, Miscellaneous Stream #437	French Drain	Active	Accepted	Reclassify as Rejected	Steam Condensate; Associated with WIDS site 3712 USSA.	TPD
300-21	300-21, 333 Building Underground Limestone Tank	Neutralization Tank	Inactive	Rejected	Rejected	Tank removed in 1973; UPR-300-13 addresses the soil.	TPD2
300-27	300-27, Soil Contamination at 329 Biophysics Laboratory	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Minor amount of rad soil found & removed in 1991.	TPD2
300-42	300-42, 306E Fabrication and Testing Laboratory	Process Unit/Plant	Active	Rejected	Rejected	Active facility	TPD2
300-47	300-47, Residual Hazardous Substances Northwest of 3708 Building	Unplanned Release	Inactive	Rejected	Rejected	Tanks removed; contamination is unsubstantiated.	TPD2
300-55	300-55, 309 Rupture Loop Holding Tank, Rupture Loop Hold-up Tank, RLT-2, 307-D	Storage Tank	Inactive	Accepted	Reclassify as Rejected	Tank removed; new site created for outfall line to river	TPD2
313 CRO	313 CRO, 313 Copper Remelt Operations, 313 Building Copper Remelt Operations	Process Unit/Plant	Inactive	Rejected	Rejected	No known releases from the recycling operation in the 313 bldg.	TPD2
333 ESHTSSA	333 ESHTSSA, 333 East Side Heat Treat Salt Storage Area	Storage	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-1 burial ground area.	TPD2
333 LHWSA	333 LHWSA, 333 Laydown HWSA, 333 Laydown Hazardous Waste Storage Area	Storage Pad (<90 day)	Active	Accepted	Reclassify as Rejected	Active 90 day pad now, overlying the 618-1 burial ground.	TPD2
335 & 336 RSDF	335 & 336 RSDF, 335 & 336 Retired Sanitary Drain Field	Drain/Tile Field	Inactive	Accepted	Reclassify as Rejected	Sanitary sewer system; Need information on septic tank closure if possible.	TPD2
600-64	600-64, Underground Sanitary Sewer Line from 400 Area to WPPSS, Sanitary Waste Tie-Line from the 400 Area to WPPSS	Sanitary Sewer	Active	Rejected	Rejected	Part of sanitary sewer system in 400 Area.	TPD2
UPR-300-13	UPR-300-13, UN-300-13	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-1 burial ground. Remediate in conjunction the burial ground.	TPD2
UPR-300-14	UPR-300-14, UN-300-14, Acid Leak at 334 Tank Farm	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-1 burial ground. Remediate in conjunction the burial ground.	TPD2
UPR-300-18	UPR-300-18, UN-300-18	Unplanned Release	Inactive	Rejected	Rejected	Minor release to an employee in 1962.	TPD2
UPR-300-31	UPR-300-31, UN-300-31	Unplanned Release	Inactive	Rejected	Rejected	duplicate of UPR-300-40	TPD2
UPR-300-44	UPR-300-44, 313 Building, Uranium Bearing Waste Acid-Etch Spill, UN-300-44	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with UPR-300-38 to be remediated in conjunction with D&D of 313 bldg.	TPD2
300-112	300-112, 340 P-3 Pump Pit, Retention Process Sewer Pump Pit #3 French Drain, Miscellaneous Stream #428	French Drain	Inactive	Accepted	Reclassify as Rejected	Pump Pit Surveyed out clean	WPD
300-113	300-113, 340 Building Steam Condensate and Cooling Water, Miscellaneous Stream #341	French Drain	Active	Accepted	Reclassify as Rejected	Prior steam condensate/current water heater overflow	WPD

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
300-114	300-114, 340A Building Steam Condensate, Miscellaneous Stream #427	French Drain	Inactive	Accepted	Reclassify as Rejected	steam condensate	WPD
300-115	300-115, 340B Building Backflow Preventer Emergency Drain, Miscellaneous Stream #426	French Drain	Inactive	Rejected	Rejected	emergency drain for water	WPD
340 CHWSA	340 CHWSA, 340 Complex HWSA, 340 Complex Hazardous Waste Storage Area	Storage Pad (<90 day)	Inactive	Accepted	Reclassify as Rejected	<90 day storage pad	WPD
600-210	600-210, 300 Area TEDF Outfall	Outfall	Active	Rejected	Rejected	NPDES permitted outfall	WPD
400 FD1A	400 Area French Drain 1A	French Drain	Active	Accepted	Reclassify as Rejected	HVAC Condensate	SPO
400 FD1B	400 Area French Drain 1B	French Drain	Active	Accepted	Reclassify as Rejected	HVAC Condensate	SPO
400 FD2	400 Area French Drain 2	French Drain	Active	Accepted	Reclassify as Rejected	HVAC Condensate and Stormwater	SPO
400 FD3	400 Area French Drain 3	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater	SPO
400 FD4	400 Area French Drain 4	French Drain	Active	Accepted	Reclassify as Rejected	HVAC Condensate and Stormwater	SPO
400 FD5	400 Area French Drain 5	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater and Heat Exchanger Condensate	SPO
400 FD6	400 Area French Drain 6	French Drain	Inactive	Accepted	Reclassify as Rejected	Stormwater and Heat Exchanger Condensate	SPO
400 FD7	400 Area French Drain 7	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater and HVAC Condensate	SPO
400 FD8	400 Area French Drain 8	French Drain	Active	Accepted	Reclassify as Rejected	HVAC Condensate	SPO
400 FD9	400 Area French Drain 9	French Drain	Active	Accepted	Reclassify as Rejected	Sanitary and Salt Water (from Water Softener)	SPO
400 FD10	400 Area French Drain 10	French Drain	Active	Rejected	Rejected	Stormwater	SPO
400 FD10A	400 Area French Drain 10A	French Drain	Active	Rejected	Rejected	Stormwater	SPO
400 RFD	400 Area Retired French Drains	French Drain	Inactive	Rejected	Rejected	No Specific Locations	SPO
400 RSP	400 Area Retired Sanitary Pond	Pond	Inactive	Accepted	Reclassify as Rejected	Sanitary Sewage	SPO
400 SBT	400 Area Sand Bottom Trench, Cooling Tower Overflow Trench.	Trench	Inactive	Rejected	Rejected	Non-Hazardous Cooling Tower Blowdown	SPO
400-1	400-1 Dump Site	Dumping Area	Inactive	Accepted	Reclassify as Rejected	Construction Debris	SPO
400-2	400-2 Concrete Batch Plant	Process Unit/Plant	Inactive	Rejected	Rejected	Construction Debris	SPO
400-3	400 Area Storm Drain Outfall Trench, Miscellaneous Stream #732	Trench	Active	Rejected	Rejected	Stormwater	SPO
400-4	Suspected Burial Ground (East of FFTF)	Burial Ground	Inactive	Accepted	Reclassify as Rejected	Construction Debris	SPO
400-6	400-6 Material Dumping Area (North of FFTF)	Dumping Area	Inactive	Accepted	Reclassify as Rejected	Construction Debris	SPO
400-8	400-8 Construction Material Dumping Area (North of FFTF)	Dumping Area	Inactive	Accepted	Reclassify as Rejected	Construction Debris	SPO
400-9	400 Area Retired Portable Sanitary Sewer Treatment Plant	Sanitary Sewer	Inactive	Accepted	Reclassify as Rejected	Sanitary Sewage	SPO
400-10	400 Area French Drain #11, Miscellaneous Stream #26	French Drain	Active	Rejected	Rejected	Stormwater	SPO
400-13	400-13 Waste Dumping Site (East of FFTF)	Dumping Area	Inactive	Accepted	Reclassify as Rejected	Construction Debris	SPO
400-14	400-14 Burn Pit (East of FFTF)	Burn Pit	Inactive	Accepted	Reclassify as Rejected	Miscellaneous Trash	SPO
400-16	4831 Flammable Storage Facility	Storage	Inactive	Accepted	Reclassify as Rejected	Used for product storage only	SPO
400-17	Buried Construction Waste Area #1	Burial Ground	Inactive	Accepted	Reclassify as Rejected	Construction Debris	SPO
400-18	Buried Construction Waste Area #2	Burial Ground	Inactive	Accepted	Reclassify as Rejected	Construction Debris	SPO
400-19	440 Building 90-Day Waste Accumulation Area	Storage Pad (<90 day)	Active	Accepted	Reclassify as Rejected	Active 90-Day Storage Pad	SPO
400-20	Altitude Valve Pit T-58	Valve Pit	Active	Rejected	Rejected	Duplicate of 400 FD10	SPO
400-21	Altitude Valve Pit T-87	French Drain	Active	Rejected	Rejected	Duplicate of 400 FD10A	SPO

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
400-22	Altitude Valve Pit T-330 French Drain	French Drain	Active	Rejected	Rejected	Discharge to Process Sewer	SPO
400-23	Well Pump P-14 French Drain, Miscellaneous Stream #34	French Drain	Active	Accepted	Reclassify as Rejected	Raw Well Water	SPO
400-24	Well Pump P-15 French Drain, Miscellaneous Stream #35	French Drain	Active	Accepted	Reclassify as Rejected	Raw Well Water	SPO
400-25	Well Pump P-16 French Drain, Miscellaneous Stream #36	French Drain	Active	Accepted	Reclassify as Rejected	Raw Well Water	SPO
400-26	451-A Substation and B/N Plant French Drain	French Drain	Active	Rejected	Rejected	Stormwater	SPO
400-28	FFTF Dichlorodifluoromethane Releases	Unplanned Release	Active	Rejected	Rejected	Coolant Releases to Air	SPO
400-29	FFTF PCB-Containing Transformers	Control Structure	Active	Rejected	Rejected	Within Buildings or on Rooftops	SPO
400-32	North Construction Dry Well	French Drain	Inactive	Accepted	Reclassify as Rejected	Stormwater	SPO
400-33	South Construction Dry Well	French Drain	Inactive	Accepted	Reclassify as Rejected	Stormwater	SPO
400-34	Northwest Surface Water Drainage Ditch, Miscellaneous Stream #733	Ditch	Inactive	Rejected	Rejected	Stormwater	SPO
400-35	Southwest Surface Water Drainage Ditch, Miscellaneous Stream #734	Ditch	Active	Rejected	Rejected	Stormwater	SPO
403 FD	French Drain Discharge from 403 Building	Drain/Tile Field	Active	Accepted	Reclassify as Rejected	Blowdown, HVAC Condensate, Stormwater, Janitorial Solutions	SPO
4713-B FD	4713-B French Drain, Miscellaneous Stream #33	French Drain	Active	Accepted	Reclassify as Rejected	Water from Fire Sprinkler and Eye Wash System	SPO
4713-B HWSA	4713-B Hazardous Waste Storage Area	Storage Pad (<90 day)	Active	Accepted	Reclassify as Rejected	Storage Pad	SPO
4713-B LDFD	4713-B Loading Dock French Drain, Miscellaneous Stream #469	Drain/Tile Field	Active	Accepted	Reclassify as Rejected	Stormwater Runoff	SPO
4721 FD	French Drain Discharge from 4721 Building, Miscellaneous Stream #28	French Drain	Active	Accepted	Reclassify as Rejected	Stormwater Drainage	SPO
UPR-400-1	400 Area Coolant Spill, UN-400-1	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	50 gallon Ethylene Glycol Spill	SPO
600-1	600-1, Westinghouse Debris Pit	Dumping Area	Inactive	Rejected	Reclassify as Rejected	Inert Demolition Debris	RPD
600-96	600-96, 618-10 Borrow Pit	Depression/Pit (nonspecific)	Inactive	Rejected	Rejected	Borrow pit used during burial ground stabilization activities.	RPD
600-97	600-97, 618-11 Borrow Pit	Depression/Pit (nonspecific)	Inactive	Rejected	Rejected	Borrow pit used during burial ground stabilization activities.	RPD
618-6	618-6, Solid Waste Burial Ground #6	Burial Ground	Inactive	Accepted	Reclassify as Rejected	Burial ground no longer exists. Waste was moved to 618-10 Burial Ground.	RPD
UPR-600-1	UPR-600-1, Contamination spread by fire at 618-10 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-10 burial ground	RPD
UPR-600-2	UPR-600-2, Contamination spread by leak during "milk bucket" burial at 618-10 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-10 burial ground	RPD
UPR-600-3	UPR-600-3, Contamination spread by dust leak during container burial at 618-10 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-10 burial ground	RPD
UPR-600-4	UPR-600-4, Contamination spread by dust leak during container burial at 618-11 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-11 burial ground	RPD
UPR-600-5	UPR-600-5, Contamination spread by dust leak during container burial at 618-11 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-11 burial ground	RPD
UPR-600-6	UPR-600-6, Contamination spread by dust leak during container burial at 618-11 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-11 burial ground	RPD
UPR-600-7	UPR-600-7, Contamination spread by dust leak during container burial at 618-11 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-11 burial ground	RPD
UPR-600-8	UPR-600-8, Contamination spread by dust leak during container burial at 618-11 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-11 burial ground	RPD
UPR-600-9	UPR-600-9, Contamination spread by dust leak during container burial at 618-11 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-11 burial ground	RPD
UPR-600-10	UPR-600-10, Contamination spread by dust leak during container burial at 618-11 Burial Ground	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Consolidated with the 618-11 burial ground	RPD
300-12	325 Laboratory Diesel Fuel Tank	Storage Tank	Inactive	Rejected	Rejected	Tank removed; Site sampled	PNNL

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RE Division
300-196	3745 Building Steam Condensate, Misc. Stream #399	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-197	3745 Building Steam Condensate, Misc. Stream #398	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-198	3745 Building Steam Condensate, Misc. Stream #397	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-199	3745A Building Steam Condensate, Misc. Stream #380	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-200	3745B Building Steam Condensate, Misc. Stream #379	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-201	3762 Building Steam Condensate, Misc. Stream #491	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-203	377 Building Steam Condensate, Misc. Stream #446	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-212	MO010 Building Steam Condensate Sump, Misc. Stream #400	French Drain	Inactive	Accepted	Reclassify as Rejected	Steam condensate	PNNL
300-229	325 Building South Stairwell Drain, Misc. Stream #264, duplicate of 300-98	French Drain	Active	Rejected	Rejected	Stormwater; duplicate of 300-98	PNNL
331-C HWSA	331-C Low-level Radioactive Waste Storage Area	Former 90 day Storage Pad	Inactive	Accepted	Reclassify as Rejected	Now a rad waste storage area	PNNL
350 HWSA	350 Building Hazardous Waste Storage Area	Storage Pad (<90 day)	Active	Rejected	Reclassify as Rejected	Active <90 day storage pad	PNNL
UPR-300-43	300 Area Solvent Refined Coal Spill, UN-300-43	Unplanned Release	Inactive	Accepted	Reclassify as Rejected	Spill from corroded container cleaned up	PNNL
				TOTAL SITES REJECTED:	255		
SITES PROPOSED FOR REMEDIAL ACTION (FOCUSED FEASIBILITY STUDY AND PROPOSED PLAN)							
300-43	300-43, Unplanned Release Outside the 304 Building	Unplanned Release	Inactive	Accepted	Proposed Plan	Soil contamination around 304CF and 304SA; Remediate with D&D of these facilities.	TPD
300-46	300-46, Soil contamination surrounding 3706 Building	Unplanned Release	Inactive	Accepted	Proposed Plan	Probable extensive subsurface contamination around the 3706 building; Remediate with D&D of Facility.	TPD
300-224	300-224, WATS and U-Bearing Piping Trench	Trench	Active	Accepted	Proposed Plan	Remediate with D&D of surrounding facilities and general area. RCRA/CERCLA Integ. Site.	TPD
UPR-300-4	UPR-300-4, UN-300-4	Unplanned Release	Inactive	Accepted	Proposed Plan	Extensive history of multiple releases around the 321 building; Remediate with D&D of Facility.	TPD
303-M SA	303-M SA, 303-M Building Storage Area	Storage	Inactive	Accepted	Proposed Plan	RCRA site transitioned to CERCLA to be remediated in conjunction with D&D of the facility. See 303-M UOF.	TPD
303-M UOF	303-M UOF, 303-M Uranium Oxide Facility	Process Unit/Plant	Inactive	Accepted	Proposed Plan	RCRA site transitioned to CERCLA to be remediated in conjunction with D&D of the facility.	TPD
300-16	300-16, Solid Waste Near 314 Building, Utility Pole Replacements	Unplanned Release	Inactive	Accepted	Proposed Plan	Yellow cake found on bottom of power poles.	TPD2
300-28	300-28, Solid Waste Site Near 303-G Building	Unplanned Release	Inactive	Accepted	Proposed Plan	Rad soils found all along Ginko St.	TPD2
300-48	300-48, Thorium Oxide and Fuel Fabrication Chemical Wastes Around 3732 Building, Storage Facility	Unplanned Release	Inactive	Accepted	Proposed Plan	Fuel fab chemical & rad wastes in soils now covered by gravel around the bldg foundation.	TPD2
313 ESSP	313 ESSP, 313 East Side Storage Pad, 313 Building East Site Storage Pad	Storage	Inactive	Accepted	Proposed Plan	Fixed contamination area near SE 313 bldg; remediate with D&D of 313 bldg.	TPD2
618-1	618-1, Solid Waste Burial Ground No. 1, 318-1	Burial Ground	Inactive	Accepted	Proposed Plan	Remediate in conjunction w/ or after removal of surface structures	TPD2
UPR-300-17	UPR-300-17, UN-300-17	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate in conjunction w/ D&D of 333 building or the surrounding area.	TPD2
UPR-300-38	UPR-300-38, Soil Contamination beneath the 313 Building	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate in conjunction w/ D&D of 313 building. RCRA/CERCLA Integ. Site.	TPD2
UPR-300-39	UPR-300-39, UN-300-39	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate in conjunction w/ D&D of 311 Tank Farm area	TPD2
UPR-300-40	UPR-300-40, Acid Release at the 303-F Pipe Trench, UN-300-40, UPR-300-31, UN-300-31	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate in conjunction w/ 300-224 (WATS and U-Bearing Piping Trench)	TPD2
UPR-300-45	UPR-300-45, 303-F Building Uranium-Bearing Acid Spill, UN-300-45	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate in conjunction w/ 300-224 or 303-F bldg.	TPD2
UPR-300-46	UPR-300-46	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate in conjunction w/ D&D of 333 building or the 618-1 burial ground.	TPD2

DISPOSITION OF 300-FF-2 OPERABLE UNIT WASTE SITES

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
300 RLWS	300 RLWS, 300 Area RLWS, 300 Area Radioactive Liquid Waste Sewer	Radioactive Process Sewer	Inactive	Accepted	Proposed Plan	Some activities are planned to occur as part of stabilization prior to transition to CERCLA.	WPD
300 RRLWS	300 RRLWS, 300 Area Retired RLWS, 300 Area Retired Radioactive Liquid Waste Sewer System	Radioactive Process Sewer	Inactive	Accepted	Proposed Plan	retired rad sewer system	WPD
300-15	300-15, 300 Area Process Sewer System	Process Sewer	Active	Accepted	Proposed Plan	This system will eventually be transitioned to CERCLA but is currently active.	WPD
300-214	300-214, 300 Area Retention Process Sewer	Radioactive Process Sewer	Active	Accepted	Proposed Plan	This system will eventually be transitioned to CERCLA but is currently active.	WPD
300-34	300-34, 300 Area Process Sewer Leak (found during Project L-070 excavation at manhole PS-87)	Unplanned Release	Inactive	Accepted	Proposed Plan	process sewer leak assoc. w/300-15	WPD
300-40	300-40, Corrosion of Vitrified Clay Sewer Pipe	Unplanned Release	Inactive	Accepted	Proposed Plan	process sewer leak assoc. w/300-15	WPD
340 COMPLEX	340 COMPLEX, 340 Radioactive Liquid Waste Handling Facility	Storage Tank	Inactive	Accepted	Proposed Plan	Contaminated soils are known to exist around the facility. A portion is still active and some activities are planned as part of stabilization prior to transition to CERCLA/D&D.	WPD
300-8	300-8, Aluminum Recycle Storage Area, North of RR and North of 618-8, Aluminum Shavings Area	Dumping Area	Inactive	Accepted	Proposed Plan	Large area of low level rad metal shavings from fuel fab. Operations.	RPD
300-18	300-18, SCA #4, Surface Contaminated Area #4	Dumping Area	Inactive	Accepted	Proposed Plan	area of stabilized rad soil contamination	RPD
316-4	316-4, 321 Cribs, 300 North Cribs, 316-N-1, 616-4, 3-Crib	Crib	Inactive	Accepted	Proposed Plan	Liquid waste disposal site with uranium and TBP in groundwater.	RPD
600-23	600-23, Dumping Area Within Gravel Pit #11	Dumping Area	Inactive	Accepted	Proposed Plan	Misc. low level rad equipment from 1706 KE bldg.	RPD
600-47	600-47, Dumping Area North of 300-FF-1	Dumping Area	Inactive	Accepted	Proposed Plan	Scattered area of debris with areas of rad metal shavings and soil contamination.	RPD
618-2	618-2, Solid Waste Burial Ground No. 2, 318-2	Burial Ground	Inactive	Accepted	Proposed Plan	Uranium bearing waste with automotive batteries in one area.	RPD
618-3	618-3, Solid Waste Burial Ground No. 3, 318-3, Burial Ground #3, Dry Waste Burial Ground No. 3	Burial Ground	Inactive	Accepted	Proposed Plan	Single trench with uranium bearing waste from 313 bldg remodeling.	RPD
618-5	618-5, Burial Ground No. 5, Regulated Burning Ground, 318-5	Burial Ground	Inactive	Accepted	Proposed Plan	Single trench with uranium bearing waste.	RPD
618-7	618-7, Solid Waste Burial Ground No. 7, Burial Ground #7, 318-7	Burial Ground	Inactive	Accepted	Proposed Plan	Contains 100's of drums of pyrophoric materials and a pit or thoria.	RPD
618-8	618-8, Solid Waste Burial Ground No. 8, 318-8, Early Solid Waste Burial Ground	Burial Ground	Inactive	Accepted	Proposed Plan	Scattered debris under a parking lot north of the 300 Area.	RPD
618-10	618-10, 300 North Solid Waste Burial Ground, 318-10	Burial Ground	Inactive	Accepted	Proposed Plan	Large area, low to high level wastes; possible TRU; one area of oil contamination is soils.	RPD
618-11	618-11, 300 Wye Burial Ground	Burial Ground	Inactive	Accepted	Proposed Plan	Large area, low to high level wastes; definite TRU wastes.	RPD
618-13	618-13, 318-13, 303 Building Contaminated Soil Burial Site	Burial Ground	Inactive	Accepted	Proposed Plan	Mound of soil; probably low level rad contamination.	RPD
300 VTS	300 VTS, 300 Area Vitrification Test Site, In-Situ Vitrification (ISV) Test Site	Process Unit/Plant	Inactive	Accepted	Proposed Plan	The Administrative Record contains letters stating that site restoration will be conducted.	PNNL
300-24	300-24, Soil Contamination at the 314 Metal Extrusion Building	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate with D&D of Facility; Associated with WIDS sites 300-80 and 300-218.	PNNL
300-29	300-29, 305-B Berm, Source Location of UPR-600-11 Soil	Unplanned Release	Inactive	Accepted	Proposed Plan	Soil contaminated with radioactive waste	PNNL
300-33	300-33, 306W Metal Fabrication Development Building Releases	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate with D&D of Facility	PNNL
600-63	600-63, Hanford Grout Lysimeter Facility	Unplanned Release	Active	Accepted	Proposed Plan	Low-level rad contamination	PNNL
UPR-300-10	Unplanned release to soil beneath 325 Bldg., UN-300-10	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate with D&D of Facility	PNNL
UPR-300-12	UN-300-12, Contaminated soil beneath 325-A Bldg.	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate with D&D of Facility	PNNL
UPR-300-48	UPR-300-48, 325 Building Basement Topsy Pit	Unplanned Release	Inactive	Accepted	Proposed Plan	Remediate with D&D of Facility	PNNL

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RD Division
300-4	300-4, DOE 351 Substation Contaminated Soil	Unplanned Release	Inactive	Accepted	Proposed Plan	Uranium yellowcake in soils	SID2
300-5	300-5, 300 Area Fire Station Fuel Tanks, 3709A Fire Station	Unplanned Release	Inactive	Accepted	Proposed Plan	Contaminated Soils placed back in soil near adjacent facility.	SID2
300-11	300-11, Pumphouse Underground Gasoline Tank, 382 Pumphouse UGT, 382 1	Storage Tank	Inactive	Accepted	Proposed Plan	Contaminated Soils placed back in soil near adjacent facility.	SID2
TOTAL PROPOSED PLAN SITES FOR REMEDIAL ACTION:					48		
SITES PROPOSED FOR CONFIRMATION SAMPLING (FOCUSED FEASIBILITY STUDY AND PROPOSED PLAN)							
300-175	300-175, 3714 Building Steam Condensate, Miscellaneous Stream #434	French Drain	Inactive	Accepted	Proposed Plan (CSE)	Uncertainty exists as to what may have been sent to the french drain over the course of the building operation.	WPD
316-3	316-3, 307 Disposal Trenches, Process Water Trenches	Trench	Inactive	Accepted	Proposed Plan (CSE)	Potential exists for contamination greater than 300FF1 cleanup standards	WPD
UPR-300-1	UPR-300-1, 316-1, 316-1A, 307-340 Waste Line Leak, UN-300-1	Unplanned Release	Inactive	Accepted	Proposed Plan (CSE)	with D&D of the 340 Complex	WPD
UPR-300-11	UPR-300-11, UN-300-11	Unplanned Release	Inactive	Accepted	Proposed Plan (CSE)	with D&D of the 340 Complex	WPD
UPR-300-2	UPR-300-2, UN-300-2, UN-316-2	Unplanned Release	Inactive	Accepted	Proposed Plan (CSE)	with D&D of the 340 Complex	WPD
300-109	300-109, 333 Building Stormwater Runoff, Miscellaneous Stream #455	Injection/Reverse Well	Active	Accepted	Proposed Plan (CSE)	Building Stormwater Runoff; In the area of UPR-300-46.	TPD
300-110	300-110, 333 Building Stormwater Runoff, Miscellaneous Stream #456	French Drain	Active	Accepted	Proposed Plan (CSE)	Building Stormwater Runoff W/ Internal Contamination signs on the structure.	TPD
300-2	300-2, Contaminated Light Water Disposal	Trench	Inactive	Accepted	Proposed Plan (CSE)	Perform sampling in conjunction with D&D activities assoc. w/3766 building	TPD2
300-22	300-22, 309 Building B-Cell Cleanout Leak	Unplanned Release	Inactive	Accepted	Proposed Plan (CSE)	Perform sampling in conjunction w/ D&D of 309 building	TPD2
333 ESHWSA	333 ESHWSA, 333 East Side HWSA, 333 Building East Side Hazardous Waste Storage Area	Storage	Inactive	Accepted	Proposed Plan (CSE)	Perform sampling in conjunction with other sites in this area (e.g., 618-1 burial ground)	TPD2
UPR-300-5	UPR-300-5, UN-300-5	Unplanned Release	Inactive	Accepted	Proposed Plan (CSE)	Perform sampling in conjunction w/ D&D of 309 building	TPD2
300-7	300-7, Undocumented Solid Waste Burial Ground Adjacent to 618-8	Burial Ground	Inactive	Accepted	Proposed Plan (CSE)	Misc. debris with some potential for rad waste.	RPD
300-9	300-9, Early Burial Ground North of RR and North of 618-8, Solid Waste Burial Ground	Burial Ground	Inactive	Accepted	Proposed Plan (CSE)	Potential new area for this site found after completion of LFI work.	RPD
UPR-600-22	UPR-600-22, WPPSS Windrow Site, 600-21	Unplanned Release	Inactive	Accepted	Proposed Plan (CSE)	Address with 618-11 burial ground remedial actions	RPD
300-80	300-80, 314 Bldg Stormwater Runoff & Steam Condensate, Misc. Stream #268	Injection/Reverse Well	Inactive	Accepted	Proposed Plan (CSE)	Has radioactive contamination label; Associated with WIDS sites 300-24 and 300-218.	PNNL
331 LSLDF	331 LSLDF, 331 Life Sciences Laboratory Drainfield	Drain/Tile Field	Inactive	Accepted	Proposed Plan (CSE)	Abandoned drainfield for sanitary wastewater; has history of rad animal waste	PNNL
331 LSLT1	331 LSLT1, 331 Life Sciences Laboratory Trench #1	Trench	Inactive	Accepted	Proposed Plan (CSE)	Leach trench for sanitary wastewater (backfilled); has history of rad animal waste	PNNL
331 LSLT2	331 LSLT2, 331 Life Sciences Laboratory Trench #2	Trench	Inactive	Accepted	Proposed Plan (CSE)	Leach trench for sanitary wastewater (backfilled); has history of rad animal waste	PNNL
JA JONES 1	JA JONES 1, JA Jones 1, JA Jones Dumping Pit #1, JA Jones Construction Pit #1	Dumping Area	Inactive	Accepted	Proposed Plan (CSE)	Paint Dumping Area	SID2
TOTAL PROPOSED PLAN SITES FOR CONFIRMATION SAMPLING:					19		
SITES PROPOSED FOR NO ACTION (FOCUSED FEASIBILITY STUDY AND PROPOSED PLAN)							
600-22	600-22, UFO Landing Site	Dumping Area	Inactive	Accepted	No Action	No contamination found during sampling.	SID2
300-1	300-1, Old North Richland Automotive Maintenance Yard	Dumping Area	Inactive	Accepted	No Action	Surface debris removed in 1993. Site of a Native American burial ground.	RPD
TOTAL SITES FOR NO ACTION:					2		
SITES FOR D&D							
307 RB	307 RB, 307 Retention Basins	Retention Basin	Active	Accepted	Defer to D&D	These are active retention basins that will ultimately be transitioned to D&D for action.	WPD

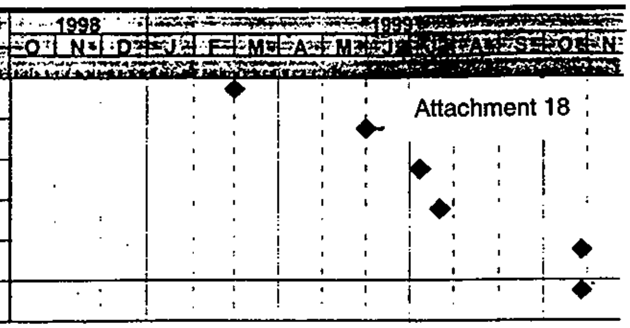
WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
300-218	300-218, 314 Building, Engineering Development Laboratory	Fabrication Shop	Inactive	Accepted	Defer to D&D	Remediate with D&D of Facility; Associated with WIDS sites 300-24 and 300-80.	PNNL
300-222	300-222, 384-W Brine Pit, 384-W Salt Dissolving Pit and Brine Pump Pit	Sump	Inactive	Accepted	Defer to D&D	Water softener brine remnants in a large sump structure assoc. w/ 384 Powerhouse	SID2
3712 USSA	3712 USSA, 3712 Uranium Scrap Storage Area, 3712 Building Uranium Scrap Storage Area, 3712 Fuels Warehouse	Storage	Active	Accepted	Defer to D&D	Contamination from uranium storage and adjacent process sewer; Assoc. w/ 300-169	TPD
300-25	300-25, 324 Building	Laboratory	Inactive	Accepted	Defer to D&D	Bldg undergoing transition to D&D.	TPD2
300-32	300-32, 333 Building, 333 N Fuels Manufacturing Building, New Fuel Cladding Facility	Fabrication Shop	Inactive	Accepted	Defer to D&D	Currently in use for office space.	TPD2
300-39	300-39, 309 Building Ex-vessel Irradiated Fuel Storage Basin, 309 Building Irradiated Fuel Storage Basin	Storage	Inactive	Accepted	Defer to D&D	Empty fuel storage basin inside 309 bldg.	TPD2
300-41	300-41, 306E Neutralizing Tank, Underground Lime Tank and Valve Pit	Neutralization Tank	Inactive	Accepted	Defer to D&D	Waste Tank adjacent to 306E.	TPD2
309-TW-1	309-TW-1, 309-TW Tank #1, 309 Holdup Tanks	Storage Tank	Inactive	Accepted	Defer to D&D	Empty liquid waste tank. Soil site 300-255 created for surrounding area.	TPD2
309-TW-2	309-TW-2, 309-TW Tank #2, 309 Holdup Tanks	Storage Tank	Inactive	Accepted	Defer to D&D	Empty liquid waste tank. Soil site 300-255 created for surrounding area.	TPD2
309-TW-3	309-TW-3, 309-TW Tank #3, 309 Holdup Tank	Storage Tank	Inactive	Accepted	Defer to D&D	Empty liquid waste tank. Soil site 300-255 created for surrounding area.	TPD2
309-WS-1	309-WS-1, Reactor Ion Exchange Pit, PRTR Ion Exchange Vault	Process Unit/Plant	Inactive	Accepted	Defer to D&D	Ion exchange pit for 309 bldg.	TPD2
309-WS-2	309-WS-2, Rupture Loop Ion Exchange Pit, Ion Exchange Vault, Rupture Loop Annex Ion Exchange Loop Vault	Process Unit/Plant	Inactive	Accepted	Defer to D&D	Ion exchange vault for 309 bldg.	TPD2
309-WS-3	309-WS-3, 309 Brine Tank	Storage Tank	Inactive	Accepted	Defer to D&D	Brine tank backfilled with soil and left in place.	TPD2
323 TANK 1	323 Tank 1, 321 Building Underground Waste Tanks, 321 Tank Farm #3	Storage Tank	Inactive	Accepted	Defer to D&D	Waste tank under 323 bldg.	TPD2
323 TANK 2	323 Tank 2, 321 Building Underground Waste Tanks, 321 Tank Farm #3	Storage Tank	Inactive	Accepted	Defer to D&D	Waste tank under 323 bldg.	TPD2
323 TANK 3	323 Tank 3, 321 Building Underground Waste Tanks, 321 Tank Farm #3	Storage Tank	Inactive	Accepted	Defer to D&D	Waste tank under 323 bldg.	TPD2
323 TANK 4	323 Tank 4, 321 Building Underground Waste Tanks, 321 Tank Farm #3	Storage Tank	Inactive	Accepted	Defer to D&D	Waste tank under 323 bldg. Still has liquid in it.	TPD2
333 WSTF	333 WSTF, 333 West Side Tank Farm, 333 West Side Waste Oil Tank, 333 Building West Side Uranium Bearing Acid Tanks, 333 WSWOT	Storage Tank	Inactive	Accepted	Defer to D&D	3 empty tanks to be addressed with 333 bldg D&D.	TPD2
				TOTAL D&D SITES:	19		
SITES CLOSED OUT							
300-23	300-23, PRTR Diesel Storage Tank, 309-1UST	Storage Tank	Inactive	Accepted	Closed Out	Closed Out under UST Program	TPD
300 SE	300 SE, 300 Area Solvent Evaporator, Solvent Evaporator, 300 ASE	Evaporator	Inactive	Accepted	Closed Out	Closed Out TSD	TPD
304 CF	304 CF, 304 Concretion Facility	Process Unit/Plant	Inactive	Accepted	Closed Out	Closed Out TSD	TPD
304 SA	304 SA, 304 Storage Area, 304 Building Storage Area	Storage	Inactive	Accepted	Closed Out	Closed Out TSD	TPD
300-35	300-35, 3706A Fuel Storage Tank	Storage Tank	Inactive	Accepted	Closed Out	Fuel tank closed in place by Ecology in 1995.	TPD2
300-53	300-53, Unplanned Release East Side of 303-G	Unplanned Release	Inactive	Accepted	Closed out	Area of the release was cleaned up in 1996.	TPD2
311 MT1	311 MT1, 311 Methanol Tank 1, 311 Tank Farm Underground Methanol Tank #1, 311-1	Storage Tank	Inactive	Accepted	Closed Out	Product tank removed in 1989, no contamination found.	TPD2
311 MT2	311 MT2, 311 Methanol Tank 2, 311 Tank Farm Underground Methanol Tank #2, 311-2	Storage Tank	Inactive	Accepted	Closed Out	Recycled methanol tank removed in 1989; no contamination found.	TPD2
313 MT	313 MT, 313 Methanol Tank, 313 Building Underground Methanol Storage Tank	Storage Tank	Inactive	Accepted	Closed Out	Tank removed in 1989; no contamination found.	TPD2
313 URO	313 URO, 313 Uranium Recovery Operations, Uranium Recovery Operations	Process Unit/Plant	Inactive	Accepted	Closed Out	Addressed in conjunction with 300 Area WATS closure activities.	TPD2
300-57	300-57, 335 Building 90-Day Waste Accumulation Area	Storage Pad (<90 day)	Inactive	Accepted	Reclassify as Closed Out	Closed 9/30/98	SPO
3718-F BS	3718-F Burn Shed	Process Pit	Inactive	Accepted	Closed Out	Closed Out	SPO

WIDS Site Code	Waste Site Name	Site Type	Site Status	WIDS Classification	CERCLA Disposition	Comments	RL Division
334 TFWAST	334 Tank Farm Waste Acid Storage Tank, Tank 4	Storage Tank	Active	Accepted	Regulated under Other Authorities	Equipment gone; part of 300 WATS TSD	TPD
334-A-TK-B	334-A Waste Acid Storage Tank 1	Storage Tank	Active	Accepted	Regulated under Other Authorities	Equipment gone; part of 300 WATS TSD	TPD
334-A-TK-C	334-A Waste Acid Storage Tank 2	Storage Tank	Active	Accepted	Regulated under Other Authorities	Equipment gone; part of 300 WATS TSD	TPD
300-219	300 Area Waste Acid Transfer Line	Process Sewer	Active	Accepted	Regulated under Other Authorities	Waste Acid Transfer Pipeline; Removal is part of Phase 3 DIP for 300 WATS TSD.	TPD
600-117	600-117, 300 Area Treated Effluent Disposal Facility (TEDF), 310 Building	Process Unit/Plant	Active	Accepted	Regulated under Other Authorities	Regulated via the NPDES permit for discharge	WPD
400 PPSS	400 Area Process Pond and Sewer System	Pond	Active	Accepted	Regulated under other authorities	Active System; State Waste Discharge Permit ST 4501	SPO
400-15	400-15 Diesel Fuel Tank Fitting Leak	Unplanned Release	Inactive	Accepted	Regulated under other authorities	Contaminated Soils Removed under UST program; bioremediation pad still open.	SPO
400-31	Sodium Storage Facility, 402 Building	Storage	Active	Accepted	Regulated under other authorities	Active TSD	SPO
437 MASF	437 Maintenance and Storage Facility	Maintenance Shop	Active	Accepted	Regulated under other authorities	Active TSD	SPO
305-B SF	305-B Storage Facility	Storage	Active	Accepted	Regulated under other authorities	RCRA Facility	PNNL
325 WTF	325 Waste Treatment Facility	Process Unit/Plant	Active	Accepted	Regulated under other authorities	RCRA Facility	PNNL
300-6	300-6, 366/366A Fuel Oil Bunkers	Storage Tank	Inactive	Accepted	Regulated under Other Authorities	To be addressed under UST regulations per agreement with Ecology.	SID2
600-58	600-58, H.J. Ashe Substation Oil/Water Separator & Drywells, BPA SWMU #13	French Drain	Active	Accepted	Regulated under Other Authorities	Site managed by BPA under lease agreement with DOE	SID2
600-59	600-59, H.J. Ashe Substation Storage Area, BPA SWMU #12, Generator Storage Area	Storage	Active	Accepted	Regulated under Other Authorities	Site managed by BPA under lease agreement with DOE	SID2
600-60	600-60, H.J. Ashe Substation Switchyard, SWMU #2	Electrical Substation	Active	Accepted	Regulated under Other Authorities	Site managed by BPA under lease agreement with DOE	SID2
600-62	600-62, Benton Switch Substation Releases	Unplanned Release	Active	Accepted	Regulated under Other Authorities	Site managed by BPA under lease agreement with DOE; managed to TSCA regs.	SID2
300-223	300-223, 384 Powerhouse Fuel Oil Day Tank #1 and #2	Storage Tank	Inactive	Accepted	Regulated under Other Authorities	To be addressed under UST regulations per agreement with Ecology.	SID2
600-243	600-243, Petroleum Contaminated Soil	Surface Impoundment	Active	Accepted	Regulated under Other Authorities	Bioremediation pad managed by UST program	SID2
UPR-300-7	UPR-300-7, UN-300-7, Oil Spill at 384 Building	Unplanned Release	Inactive	Accepted	Regulated under Other Authorities	Assoc. w/ site 300-223. To be addressed under UST regulations per agreement with Ecology.	SID2
UPR-300-42	UPR-300-42, 300 Area Powerhouse Fuel Oil Spill, UN-300-42	Unplanned Release	Inactive	Accepted	Regulated under Other Authorities	Assoc. w/ site 300-223. To be addressed under UST regulations per agreement with Ecology.	SID2
				TOTAL SITES REGULATED UNDER OTHER AUTHORITIES:	29		

TOTAL 300-FF-2 OPERABLE UNIT WASTE SITES DISPOSITIONED: 417

Attachment 18

Activity ID	Activity Description	Ver Pkg	Early Start
2200	RE-NEGOTIATION OF TPA MILESTONE M-16-03D		01MAR99*
2300	PRELIM VERIF REPORT NORTH PROC POND-TRUCK SPILL		01JUN99*
2250	VERIFICATION REPORT LANDFILL 1-D		08JUL99*
2350	PRELIM VERIF REPORT NORTH PROCESS POND		23JUL99*
2100	DRAFT A 300-FF-2 FFS		27OCT99*
2150	DRAFT A 300-FF-2 PROPOSED PLAN		27OCT99*



Project Start	01OCT98
Project Finish	28OCT99
Data Date	01OCT98
Run Date	16MAR99

Early Bar
Progress Bar
Critical Activity

REGR

Sheet 1 of 1

RA Regulator Review Dates

300 AREA

Carlson, Richard A

From: Einan, David R
Sent: Tuesday, March 09, 1999 10:40 AM
To: Carlson, Richard A; McLeod, Robert G (Bob)
Cc: James, Jeff R; Lerch, Jeffrey A
Subject: RE: COC's reduction for 300-FF-1 Waste Sites

Rich--

I agree that arsenic, thallium, benzo (a) pyrene, and chrysene should be removed from the COC list for the ponds and the clean soil stockpiles.

I'm glad you checked so that we don't have to be concerned with results for those constituents. Hopefully, by removing them from our COC list for the ponds, we may be able to eliminate a sample fraction.

Dave

-----Original Message-----
From: Carlson, Richard A
Sent: Tuesday, March 09, 1999 9:53 AM
To: Einan, David R; McLeod, Robert G (Bob)
Cc: James, Jeff R; Lerch, Jeffrey A; Carlson, Richard A
Subject: COC's reduction for 300-FF-1 Waste Sites

Dave,

I followed up on your suggestion to review the 300-FF-1 RI data for the North and South Process Ponds. I also looked at the ROD for 300-FF-1. Our collective memories are pretty good. I reviewed the data for arsenic, thallium, benzo(a) pyrene, chyrsene, and PCB's. There were numerous detections for arsenic in both ponds with a 95% UCL's from the Phase I RI of 1.9 mg/kg and 4.7 mg/kg for the North and South Ponds respectively. Site background for arsenic is 6.38 mg/kg. The average values for thallium were 0.37 mg/kg and 0.41 mg/kg for the North and South Ponds respectively. The levels were below background and eliminated in the Phase I RI preliminary screening. Thallium was included in the OU COC list because of pre-RI data of unknown quality for the Process Trenches. There was no process knowledge of chrysene or benzo(a)pyrene in the North and South Process ponds. No samples were analyzed in the RI for those two constituents in the ponds. The 95% UCL's for PCB's were 2.9 mg/kg and 2.3 mg/kg in the North and South Ponds respectively. MTCA method C is 17 mg/kg. Again, some pre-RI data identified PCB's at a higher level in the North Process Pond. So, I suggest we continue to sample for PCB's in the Pond. There is a footnote in the 300-FF-1 ROD COC table that states that benzo(a)pryene, chrysene, thallium, and arsenic are only found in the Process Trenches. The 300-FF-1 SAP identifies in numerouis sections that the COC list applies to all the wastes. My recollection was that the whole COC list was applied generically to all wastes during the DQO out of convenience. The change to be made to all applicable 300-FF-1 SAP sections is that the analysis for arsenic, thallium, benzo(a)pyrene, and chryrsene are not applicable to the North and South Process Ponds or the clean soil stockpiles generated as result of excavating those waste sites. This information has been reviewed with Bob McLeod at DOE and concurrence via reply to this cc:mail will be added to the next UMM as an attachment so this agreement gets included in the administrative record. If you can reply as soon as possible that would help as we are ready to sample once the sample locations are surveyed (today).

Thanks,

Rich

Carlson, Richard A

From: Einan, David R
Sent: Thursday, March 11, 1999 8:23 AM
To: Carlson, Richard A
Cc: McLeod, Robert G (Bob); James, Jeff R
Subject: RE: Tanker Spill cleanup

Rich--

for the record, EPA concurs with the Tanker Spill Cleanup plan and the verification sampling strategy.

Dave

-----Original Message-----
From: Carlson, Richard A
Sent: Thursday, March 11, 1999 8:15 AM
To: Einan, David R
Cc: McLeod, Robert G (Bob); James, Jeff R
Subject: Tanker Spill cleanup

Dave,

I know we have discussed this subject several times, but as I have reviewed the January and February Unit Managers Meeting Minutes, I see that we have not documented your concurrence with the plan. As you may recall, I handed out a draft plan as an attachment to the January UMM's. We just need to document your concurrence. If you want to reply to this message, I will attach your response to the March UMM minutes.

Thanks,

Rich

Distribution 072372

Unit Mangers' Meeting: Remedial Action Unit/Source Operable Units 100 and 300 Areas

Mike Thompson........DOE-RL, RP (H0-12)
Glenn Goldberg........DOE-RL, RP (H0-12)
Owen Robertson........DOE-RL, RP (H0-12)
Robert McLeod........DOE-RL, RP (H0-12)
Bryan Foley........DOE-RL, RP (H0-12)
Ellen Mattlin........DOE-RL, EAP (A5-15)

Lisa Treichel........DOE-HQ (EM-442)

Dennis Faulk........100 Aggregate Area Manager, WDOE (B5-01)

Joan Bartz........WDOE (Kennewick) (B5-18)
Phil Staats........WDOE (Kennewick) (B5-18)
David Holland........WDOE (Kennewick) (B5-18)
Shri Mohan........WDOE (Kennewick) (B5-18)
Wayne Soper........WDOE (Kennewick) (B5-18)
Ted Wooley........WDOE (Kennewick) (B5-18)
Alex Stone........WDOE (Kennewick) (B5-18)
Gail Laws........WDOE (Kennewick) (B5-18)

Lynn Albin........Washington Dept. of Health

Jeff James........BHI (L6-06)
Tamen Rodriguez........BHI (H0-17)
Chris Kemp........BHI (S3-20)
Amy Jones........BHI (H0-10)
Michelle Peterson........BHI (H0-10)
Jon Fancher........BHI (H9-02)
Joan Woolard........BHI (H0-02)
Rick Donahoe........BHI (H0-17)
Frank Corpuz........BHI (X9-06)
Rich Carlson........BHI (L6-06)
Alvin Langstaff........BHI (X3-40)
Larry Hulstrom........BHI (H9-03)
Linda Deitz........BHI (H0-20)
Alvina Goforth........BHI (H0-09) w/2
Fred Roeck........BHI (H0-17)
Mark. Sturges........CHI (X3-40)
Dave Blumenkranz........CHI (H9-02)
George Henckel BHI (H0-19)
Phyllis Geiger........BHI (H0-19)

Please inform Tamen Rodriguez (372-9562) – BHI
Of deletions or additions to the distribution list.